



NetworkWorld

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April 7, 2003 ■ Volume 20, Number 14

Low-speed frame costs on the rise

■ BY DENISE PAPPALARDO

While rates for many telecom services have long plummeted, some users are paying up to twice as much today for low-speed frame relay as they did 18 to 24 months ago, according to industry watchers and those footing the bills.

The carriers say they need to regain profitability and can no longer offer low-margin services at yesterday's prices.

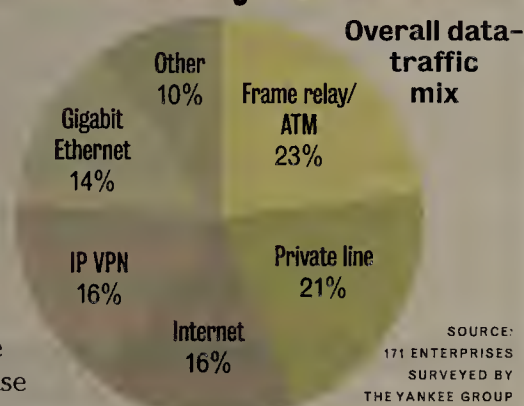
Bay State Milling in Quincy, Mass., encountered the phenomenon when it began renegotiating a frame relay contract with Sprint. Not only did the company's bills increase approximately 10% across

the board, but also the price of one 128K bit/sec link in Florida doubled, says IT Director Kim Yaworsky.

Bay State, which has a frame network that spans seven states in the U.S., has been paying \$360 per month for T-1 access on its 128K bit/sec frame relay link in

See Prices, page 60

Frame relay still works



Firm bullish on Web services

However, Merrill Lynch exec says security, mgmt. issues can be a bear.

■ BY ANN BEDNARZ

BOSTON — Rick Carey, chief technology architect at Merrill Lynch, told an audience of CTOs last week that his company is using Web services to tackle oner-

ous application integration challenges and reduce the burden of proprietary coding.

"We have thousands of applications and thousands of systems that have a great deal of difficulty interacting," Carey said, speaking

at CTO Forum, which was run by InfoWorld, a sister company to Network World.

Merrill Lynch developers have been creating reusable, standards-based Web services making transaction information locked in legacy mainframe systems available to other applications. This frees developers to build new business features rather than repetitive infrastructure projects, Carey said.

So far Merrill Lynch's Web services foray is limited to internal application connectivity. Inadequate security and unreliable messaging will keep the firm from

See Merrill, page 16

Convergence on tap for apps

■ BY PHIL HOCHMUTH

SAN JOSE — News out of last week's Voice on the Net show might signal that long-promised converged voice/data applications are just around the corner.

Siemens, Microsoft and others laid out application plans, while a host of speakers discussed the role that Session Initiation Protocol (SIP) would play in enterprise integration efforts. Conference sessions — many of them well-attended — dealt with everything from the current state of voice over IP (VoIP) to where the technology is going.

For its part, Siemens displayed

OpenScape, a new suite of SIP-based software tools that make it possible to deliver a consolidated view of various back-end communications and collaboration systems. End users employ what Siemens calls a Personal Communications Portal to access Microsoft Exchange e-mail, calendars, instant messaging, presence-based telephony features, and

voice and videoconferencing (see graphic, page 14).

Users can list their status (for example, "in the office," "working remotely," "unavailable") and input their preferred phone number (desk, cell, remote office, home), and see similar details for colleagues. Buddy lists — similar to AOL's Instant Messenger — show

See Apps, page 14

VoIP variables

IP PBX vendors are taking very different approaches to implementing VoIP. Here's a guide.

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43

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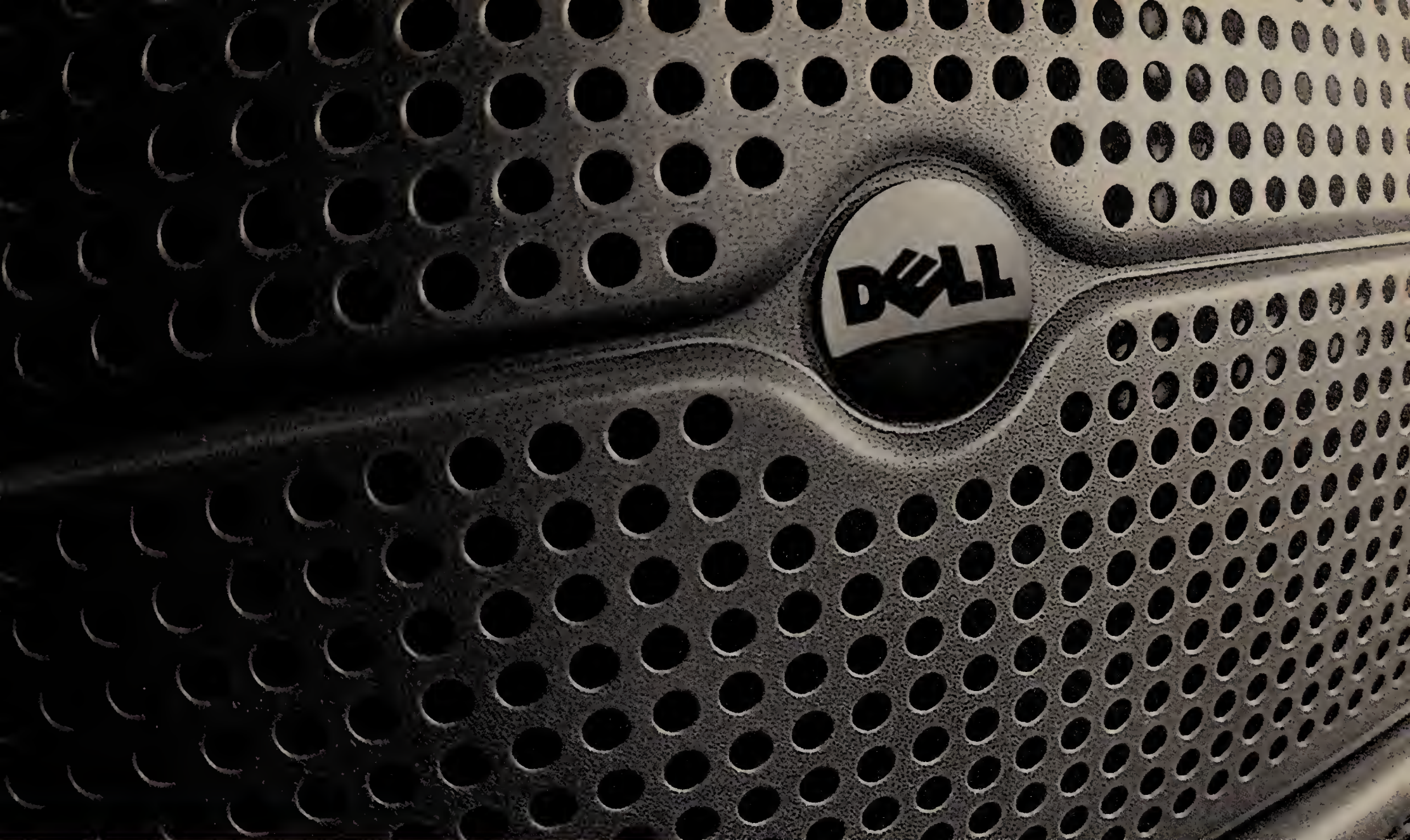
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The Satellite Pro comes with 802.11a/b capabilities. Page 38.

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VoIP variables: Traditional PBX vendors and newcomers to the market are all developing IP PBXs, but there's little consistency when it comes to how the vendors support standards, how they provide backup and how they design the basic architecture of their call control mechanisms. **Page 43.**

Sector Spotlight: The oil industry is turning to Linux clusters for high-end computing. **Page 46.**

Face-Off: We all know that some small groups within large organizations are putting in wireless LANs, but is wireless LAN technology ready for a full-scale rollout across a company. **Page 48.**

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Interactive

Forum: Weighing NAS options

"Small Business Tech" columnist James Gaskin's recent comparison of Linksys vs. Snap Server devices for the small network sparked a lot of comments from readers, especially those not too keen on Linksys. **DocFinder: 5031**

Forum: Microsoft's shifting plan has users frustrated

So what's the deal with Microsoft's collaboration strategy? Some say it's Microsoft just being Microsoft: "What did you expect?" asks one reader. **DocFinder: 5032**

Top ISP Report — February

Is your ISP measuring up? Find out with our Top ISP Report, a joint venture between *Network World* and eTesting Labs' Internet BenchMark service. **DocFinder: 5033**

Wireless LAN Buyer's Guide

In the market for WLAN gear? Compare and contrast 185 wireless LAN switches, gateways, antennas and more. **DocFinder: 4931**

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Columnists

Compendium

Build your own Google interface
Fusion Executive Editor Adam Gaffin introduces you to Elwyn Jenkins, who can tell you how to build your own Google search form. **DocFinder: 5034**

Home Base

Make a big impression
Columnist Jeff Zbar looks at SOHO phone services that provide corporate PBX features without the cost or headaches of the original. **DocFinder: 5035**

Telework Beat

More fuzzy math
Net.Worker Managing Editor Toni Kistner examines a federal report and wonders whether the federal government is really meeting its telework goals. **DocFinder: 5036**

Digital Domicile

Beyond Ethernet and Wi-Fi
Columnist Mike Wolf takes a look at unusual approaches to the connected home, such as Serconet, which creates an Ethernet backbone over in-home phone wiring. **DocFinder: 5037**

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New

Bits

Report on Microsoft security mixed

■ A report released by Forrester Research last week shows that security is still tops the list of concerns for Microsoft users, but that those concerns are not deterring them from deploying Windows-based applications. Seventy-seven percent of IT security experts at companies with more than \$1 billion in annual revenue say they have experienced Windows security problems in the past year. But 89% of the 35 respondents said they still run sensitive applications on the Windows operating system. The Forrester report lauded Microsoft for its ongoing efforts to clean up its security problems, but says the company still has work to do, specifically with patch-management tools. The report says the answer to better security lies in a partnership that connects Microsoft, independent software vendors, and users throughout the development, deployment and operations phases when running the Windows platform.

IDC tempers global growth forecast

■ Unless the war in Iraq drags on, global IT spending will rebound this year, although not by as much as previously forecast, IDC says. The new forecast sees spending increase 2.3% over last year, a downward revision of a previous forecast that saw growth of 3.7%. War and uncertainty about the global economy were cited as causes. Assuming a "relatively short war" and economic stability, IDC predicts global IT spending this year will reach \$852 billion. Overall growth will continue next year, with an increase of 4% to 6%, and hit 6% to 7% in 2005, analysts said, with the global IT market hitting \$1 trillion in revenue by 2006. IDC is optimistic about an increase in network equipment purchases, driven partly by widespread broadband adoption and data network growth. It also predicts that the converged handheld market will provide a key boost to hardware, which will have a tougher time recovering because of "fierce price competition and continued capital expenditure declines from telecom operators," IDC said.

Apache upgrade addresses security issues

■ The latest release of Apache 2.0 fixes a number of security vulnerabilities including an as-yet-undisclosed flaw that could be used to launch a denial-of-service attack against machines running the popular Web server, according to information released by the Apache Software Foundation. The new release, Version 2.0.45, is intended "principally as a security and bug fix release," according to the ASF. Foremost on the list of fixed vulnerabilities was a security hole discovered by David Endler, director of Technical Intelligence at security intelligence firm iDefense. Details on the vulnerability Endler discovered were not disclosed, but Apache 2.0 users were encouraged to upgrade. Endler will publish a report on the vulnerability this week, according to the ASF.

COLUMN

New user for power over Ethernet?

Mike Gunderloy has an idea for software that displays Weblog headlines: "You know what I really want from my news aggregator? A filter I could turn on to simply destroy any incoming message on the merits of C# vs. VB or Hungarian naming. Perhaps one that would go out and actually delete the originating Web site could be a value-add for the Professional Edition." Find out more at www.nwfusion.com, DocFinder: 5038.

■ The Good The Bad The Ugly



Dell is swell. While so many network companies are stumbling, Dell continues to zip along. COO and President Kevin Rollins last week told financial analysts that the company's goal of boosting annual revenue to \$60 billion is looking realistic for the \$35.4 billion company. "We're seeing double-digit year-over-year revenue growth in all regional markets and customer segments," he boasted.



They should know better. High-tech companies need to treat their customers better online, according to a survey of 500 Web sites recently conducted by consulting firm The Customer Respect Group. Noting that a one-third of high-tech companies don't respond to e-mail inquiries through their Web sites, CEO Donal Daly says "[G]iven the dramatic slump in high-tech fortunes during the past few years and their in-house technology talent, it's amazing all firms in this sector don't make a stronger effort with their Web sites." ➤



How do you really feel, Larry? Oracle CEO Larry Ellison let loose on Microsoft last week at an Oracle partners event: "[Microsoft has] already been killed by one open source product [Apache]. Slaughtered, wiped out, taken from market dominance to irrelevance. They had a virtual monopoly on Web servers, and then they were wiped off the face of the earth. And it's going to happen to them again on Linux."

Van Siclen resigns from Interwoven

■ Interwoven President and CEO John Van Siclen resigned last week. Company chairman Martin Brauns, who was CEO from 1998 to 2002 when Van Siclen took over, will fill in as interim CEO until a replacement is named, the content management software vendor said. Van Siclen joined Interwoven in 1999 as vice president of business development and later was promoted to COO. Interwoven will report quarterly results April 17, but said last week that it expects total revenue in the range of \$24.5 million to \$25.5 million and a loss of about 10 cents per share.

Recording industry group sues students

■ The Recording Industry Association of America has sued four university students who allegedly ran file-sharing networks on their school's local networks. The students, two at the Rensselaer Polytechnic Institute and one each at Princeton University and Michigan Technological University, operated "local-area Napster networks," the RIAA said in a statement last week. File-swapping pioneer Napster was shut down by the entertainment industry two years ago. The RIAA had previously identified campuses as a hotbed of music piracy, but the lawsuits are the first the organization has filed against students. Before, the RIAA's legal fire was aimed mostly at companies offering file-swapping software such as Kazaa and Morpheus.



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Mgmt. vendors beat automation drum

BMC and IBM Tivoli separately announce software to automatically manage networks.

■ BY DENISE DUBIE

IBM and BMC Software this week separately will announce product road maps that industry watchers say will begin to deliver real-time automation and service management features that vendors have long promised enterprise customers.

IBM will unveil the Tivoli Autonomic Monitoring Engine at its DeveloperWorks Live and Planet Tivoli conference in New Orleans. The company says the software will help customers create links among end users, resources and business processes to more effectively manage applications and services.

Network managers will configure the server software to monitor specific business services, such as help desk, or applications such as SAP's CRM software. From there, the autonomic engine will use rules built into the software (or tailored upon installation by the customer) to correlate data from

disparate sources, detect potential problems and take appropriate corrective action.

The primary difference between Tivoli's Autonomic Monitoring Engine and automation features in products from IBM and others is that Tivoli wrote the software to include the most common problems and fixes to specific network devices, systems, servers, databases and applications. To activate automation in many management tools, network managers have to configure the software when installed to take corrective action. In this case, Tivoli executives say, the software comes with 300 resource models, or predefined if-then scenarios to help the software self-manage and self-heal, two tenets of IBM's autonomic computing initiative.

Rick Sturm, senior analyst at Enterprise Management Associates, says Tivoli is delivering an automation tool that can be slowly integrated into an enterprise

network manager's tool kit. While IBM says it will include autonomic features throughout its WebSphere, DB2, Lotus, Rational and Tivoli software divisions, Sturm says the logical place for IBM to start proving it can automate computing is within its network and systems management arm.

Corporations have had to suffer through long deployment cycles and poor software in the past. Sturm says things are changing, but slowly.

"It's not going to be that suddenly everything is automated; it's going to be one piece at a time," he says. "Tivoli has been building intelligence into their software to make IT operations more efficient. No one is ever perfect, but they have been making significant strides."

The software is expected to be generally available this fall, and pricing has yet to be determined. An autonomic tool-kit version of the software is in beta trials with

See Management, page 14

The three S's

In addition to introducing autonomic computing technology, Tivoli is enhancing its systems, storage and security monitoring product lines with these offerings:

Product line	Product	What's new
System	Service Level Advisor 1.2.1	Service-level agreement wizard builds SLAs; visualized SLA reports.
	Enterprise Console 3.9	Web console for remote access; pre-configured rules for event management.
	Remote Control 3.8	Support across firewalls; central logging.
Storage	Storage Manager 5.2	Improves firewall security-enabled backups without client-initiated sessions.
	Storage Resource Manager 1.2	Automated file system extension for AIX and Solaris.
	SAN Manager 1.2	Automated error detection and fault isolation.
Security	Access Manager	Integration with nine third-party products, including nCipher's nForce hardware security module and OpenConnect Systems' WebConnect with Single Sign-On.

Q & A



CEO speaks of Veritas branching out

Network World Senior Editor

Deni Connor recently spoke with Veritas CEO Gary Bloom, who for the first time talked publicly about the company's plans to integrate the products of two acquisitions — application and performance management company Precise Software, and server and storage provisioning start-up Jareva.

How will their products fit into your software strategy?

They will move us not only into the server virtualization market but also into the application performance management market, as well as into storage resource management. Jareva does exactly for servers what Veritas does for storage — get better utilization of servers and manage them with significantly fewer

people. There's a natural synergy that says if we are already managing a customer's storage environment, let Veritas manage their server environment and give their network better performance.

Does that mean Veritas will be doing server provisioning?

Yes. What Jareva does is put all the servers into a pool like virtualization does in the storage world and lets administrators allocate server capacity based on performance requirements. You can share and move resources to applications at the end of the month for financial closing operations. Jareva lets you resource-share your server and storage hardware, and get better performance with less acquisition cost.

Are you looking at this from an application or business-process point of view as far as managing server and storage resources?

What Veritas does today is provide a highly available infrastructure, which uses resources efficiently. Now we will be able to manage the performance of applications. The Precise software may find that an Oracle application doesn't have enough storage allocated to it, so it might automatically add capacity to the storage. It may determine that a SAP application needs more server capacity and communicate with the Veritas and Jareva software to add more server capacity.

We will be able to dynamically allocate resources based on a viewpoint from the application user all the way through the data stored on disk. The software also lets you look at all those layers and says

why aren't you getting optimal performance. Once you have predictive information on what's wrong, you can immediately go to the next step with the Veritas resources underneath and fix the problem automatically.

What are you seeing as the impact of the economy on IT thinking and spending?

We have a handful of macro-economic things going on, whether it is the ongoing weakness of the economy, the war in Iraq or the SARS respiratory disease. But at the same time, nothing has fundamentally changed. It's still conservative in IT spending. At some point IT has to make adjustments, which have to do with the life span of technology in the market and with looking for ways two to three years into a downturn to actually change their cost model for their IT operations.... We can show them how to more efficiently manage their storage environments, ultimately saving them capital acquisition costs but also making their IT labor more efficient.

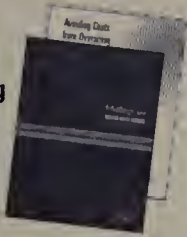
Is that saying you want IT to look at existing products and how they can be improved with new features?

Sure, a lot of it is taking advantage of the low utilization rates in storage that most customers have today. If you go back two years, average utilization rates by most studies was 35% to 40%. When I talked to CIOs, they said their utilization was 10% to 20%. Now, industry studies say utilization is moving closer to 50%. That still means that half of your storage is underutilized. ■

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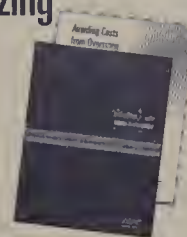
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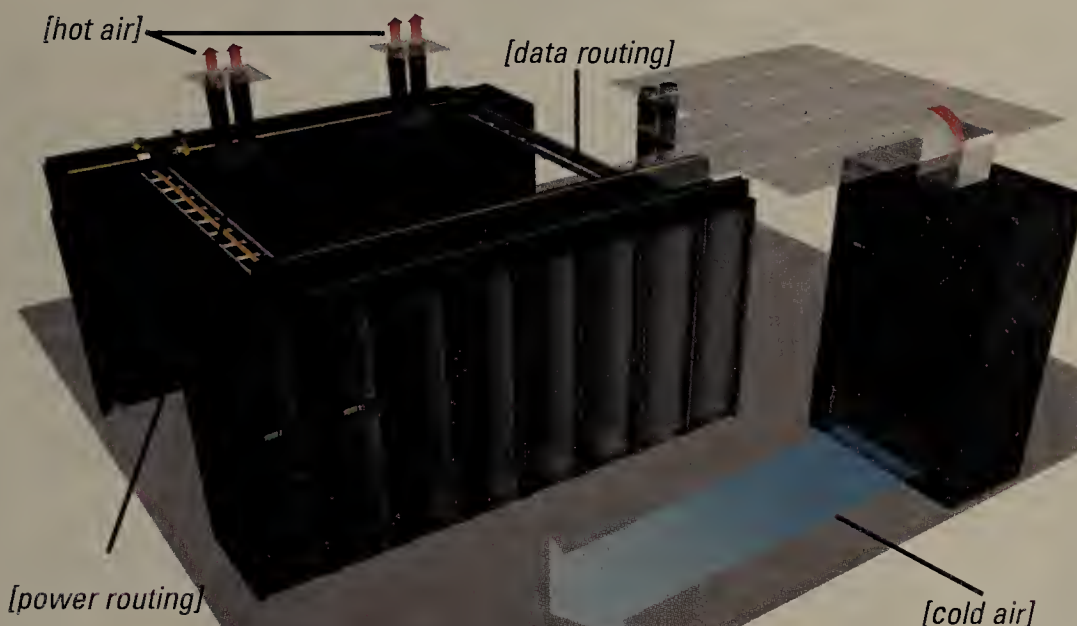
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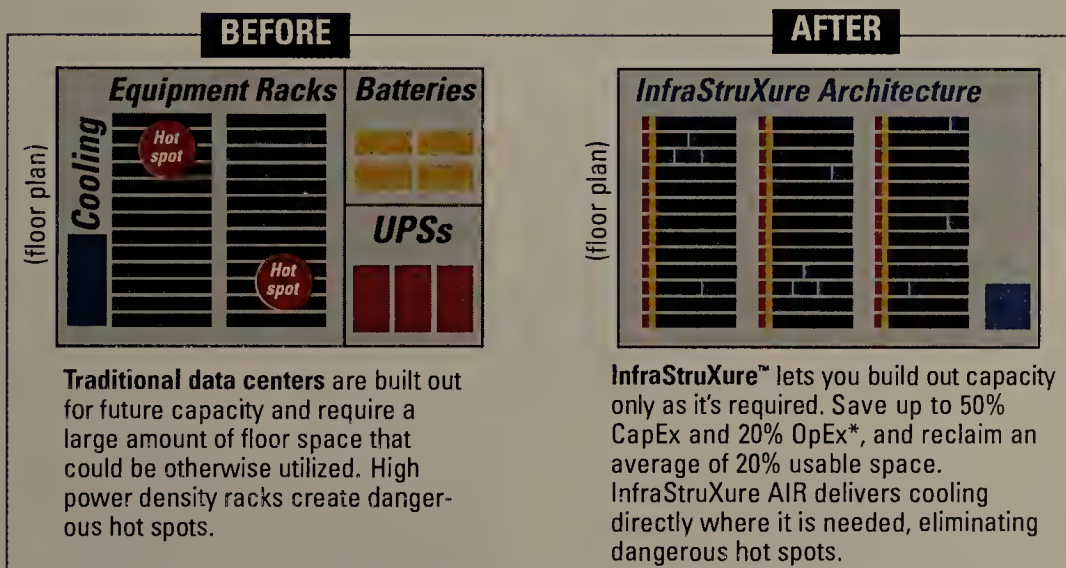
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Sprint to offer Feds their own 'Internet'

■ BY GRANT GROSS

WASHINGTON, D.C. — Sprint last week announced plans for a summer launch of a private IP network aimed at security-conscious U.S. government agencies.

The unnamed network will mimic Sprint's SprintLink enterprise-class, IP backbone network and offer most of the same features, except that it won't be connected to the Internet.

Available services will include virtual LANs, VPNs and voice over IP, and Sprint will charge a 10% to 15% premium over the cost of SprintLink.

The "government-grade" private Internet should have one or two agencies as customers by its launch in June, a Sprint spokesman says. The service is designed to ease customer worries that "someone in an Internet cafe in Beijing could get into the network," the spokesman says.

Customers using the network would have to use SprintLink or another public backbone for outside e-mail or Web surfing, but individual users won't be able to tell when they're switching back and forth, he says.

Berge Ayvazian, senior research fellow with The Yankee Group, says Sprint's timing is good, given that U.S. government agencies are becoming aware of security issues.

The Sprint project is the first such private IP network for government users, Ayvazian says, and he sees customers converting from other private network services that don't use IP, such as frame relay.

Ayvazian isn't sure how big the market will be for such services, but he notes that the cost to Sprint was minimal because the company is using Cisco gear recycled from the carrier's Integrated On-Demand Network broadband service, aborted late last year.

Sprint did not disclose the cost of constructing the new network.

Gross is a correspondent with IDG News Service's Washington D.C. bureau.

Microsoft eases directory work

■ BY JOHN FONTANA

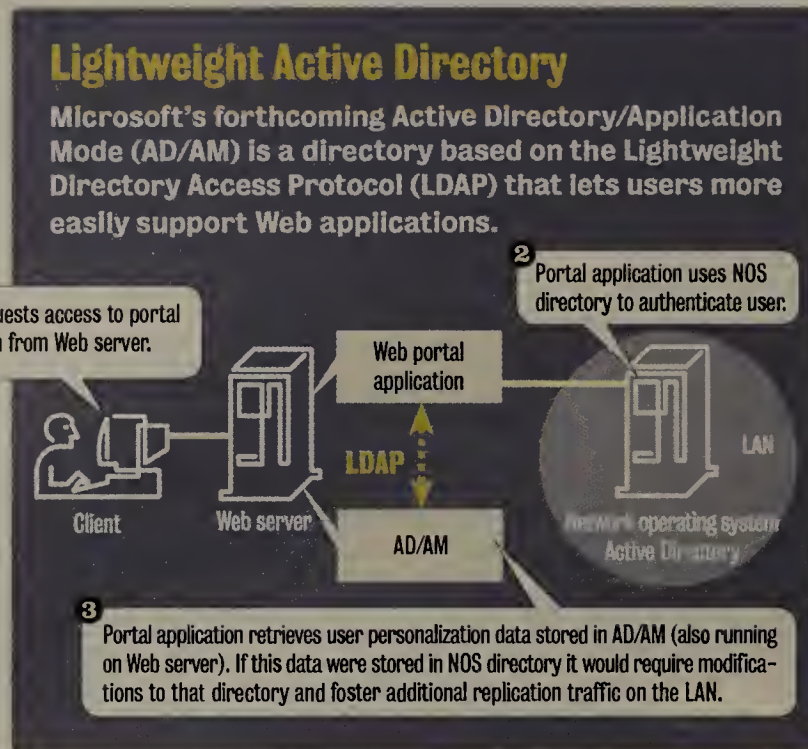
REDMOND, WASH. — Microsoft is preparing for a major evolution of Active Directory this summer that will allow it to play catch-up with competitors and provide companies the ability to more easily use the software to support Web-based and other applications.

Microsoft last week released the first public beta version of Active Directory/Application Mode (AD/AM), a simple Lightweight Directory Access Protocol (LDAP)-based directory to support applications. AD/AM is a stand-alone version of the directory that operates on Windows, but does not require integration with a corporation's Active Directory infrastructure.

AD/AM can be dedicated to one application to isolate data specific to that application, such as policies or management information. AD/AM prevents the core Active Directory from getting bogged down with the type of information that would foster changes to the directory's schema, which defines its structure and content. Directory-enabled applications almost always require schema changes, which add data to the directory and complexity to its operation.

While AD/AM serves as an independent data repository, it can rely on Active Directory as a user authentication engine, meaning companies don't have to replicate that information to AD/AM.

"AD/AM is very interesting," says a directory administrator for a



large multinational company who asked not to be identified. "It represents a maturity for [Active Directory]. For people who understand directories this perks up their ears because they know it can ease support problems and reduce replication traffic."

The administrator says his company has more than 10G bytes of data in its Active Directory, which creates a lot of replication traffic. "We have divisions that want to use the directory to support their applications, but that would change our schema and add to our replication problem."

He says it would be nice for those divisions to have a dedicated directory, especially one his staff is trained to support.

"AD/AM opens up an opportunity for Microsoft to do something in the enterprise and e-business roles that they were restricted from doing," says Mike Neuenschwander, an analyst with Burton Group.

The restrictions came because Active Directory, which is the only directory baked into an operating system, is complicated to deploy. The directory must sit on its own server, called a domain controller, and must be run with other operating system services such as Kerberos and the DNS. That can create a lot of cost, security and support issues for companies that need an LDAP-based directory.

In contrast, AD/AM does not have to sit on a domain controller, and multiple copies of the directory can run on one box to service multiple applications. AD/AM runs as an independent

service on a network as opposed to a network operating system service such as Active Directory.

"Microsoft coded themselves into a hole and now they have gotten themselves out, but we shouldn't get overly excited because they are late to the game," Neuenschwander says.

Other vendors are providing these kinds of general-purpose LDAP directories, most notably Novell with its eDirectory and Sun with Sun One Directory Server. Neuenschwander says AD/AM should put the most pressure on Sun, which has yet to cement its multimaster replication technology.

The two Microsoft competitors have each used their LDAP-based directories to build a base of more than a billion users, according to Gartner.

"Microsoft is looking at that with its little 70 million or so users and they want a piece of that action," says John Enck, an analyst with Gartner. "The target for Microsoft is that LDAP market."

Microsoft plans to ship AD/AM before July, according to Jackson Shaw, technical product manager for directory services at Microsoft. Shaw says Microsoft has not announced pricing but that it should be about the same as its Active Directory Internet Connector, which is priced at \$2,000.

AD/AM will run on Windows Server 2003, which ships later this month, and Windows XP, so developers can run a directory on their desktop for testing applications. ■



THIS WEEK'S QUESTION:

Which management software company has acquired firms IT Masters and Remedy?

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Security start-up to block Trojans

■ BY ELLEN MESSMER

AUSTIN, TEXAS — Start-up WholeSecurity debuts this week with Web server software designed to prevent remote-access Trojans or eavesdropping software from penetrating networks during e-commerce or employee interactions over the Internet.

The company says its Confidence Online helps guard against identity theft and network compromise by detecting and blocking any action by harmful Trojans such as BackOrifice and Subseven, as well as legitimate remote-administration tools such as Symantec's PCAnywhere. The goal is to prevent any potential entry-way from desktops into corporate networks during interaction over the Web, says Tony Alagna, founder of WholeSecurity.

Before founding WholeSecurity in 2000, Alagna was a consultant at the Information Security Penetration Institute in Annapolis, Md., and conducted vulnerability assessments on government networks. The 32-employee company has received \$8.5 million in funding from Venrock Associates and New Enterprise Associates.

Confidence Online scans and blocks after it's automatically downloaded from the Web server to a Microsoft or Netscape browser of an employee or e-commerce partner. The blocking continues until the Web session is over. The software can be configured to delete desktop code, but WholeSecurity does not recommend that in most circumstances.

The software has been beta-tested at Deutsche Bank and the Lower Colorado River Authority (LCRA) in Texas.

"We're using it to weed out Trojans and spyware like Gator," says Michael Allgeier, LCRA data security officer. Confidence Online works like a "background check" on computers before they are allowed into the LCRA network, he says.

But the software might elicit controversy because it scans inside laptops, an action some see as a violation of privacy.

"Yes, it is controversial," acknowledges Scott Olson, WholeSecurity's vice president of marketing. But the company thinks most people will conclude that the benefits of preventing fraud and network compromise outweigh

the desktop-privacy arguments.

Confidence Online costs about \$30 per user for employees and per-case pricing for e-commerce applications.

In other security news, Waveset and Entrust are partnering on Entrust Secure Identity Management, which combines Waveset's identity-management product, Lighthouse, with Entrust's access-control software, getAccess. Available for Windows and Unix, it's expected to ship in June at a cost of about \$200,000. Waveset's next version of Lighthouse, Version 4, will ship later this year. It will also include the Entrust public-key infrastructure technology to automate signing and time-stamping of management transactions and audit logs. ■

Network Associates buys two start-ups

Making good on a recent pledge to expand into new segments of the security industry, Network Associates last week bought its way into the emerging intrusion-prevention system (IPS) market by agreeing to acquire two start-ups for a combined \$220 million.

The company is purchasing privately held IntruVert Networks, a maker of network-based IPS products, for \$100 million and Entercept Security Technologies, a vendor of host-based IPS offerings, for \$120 million. IPS products are designed to block attacks, not just detect them as do intrusion-detection systems (IDS).

The IntruVert deal signals a break in the strategic relationship between Network Associates and IDS vendor Internet Security

Systems (ISS). Last May, Network Associates licensed ISS technology with the intent of incorporating it into its own high-speed protocol-analysis product, Sniffer, by mid-2003. Last month, Network Associates executives acknowledged they were looking at other options.

Rival Symantec also has entered the IPS market via the acquisition route. It bought Recourse Technologies, a maker of network-based IPS products, for \$135 million last year.

Network Associates has gone through acquisitive periods before, such as in 1998 when it bought 10 companies. The company is off to a fast start this year: Aside from buying the two companies last week, it bagged antispam start-up DeerSoft in January for an undisclosed sum.

Box speeds SSL traffic, balances loads

■ BY JENNIFER MEARS

Managed security firm Guardent was looking for ways to beef up its services infrastructure, but wanted to do it without complicating its data center architecture.

After looking at load balancers and Secure Sockets Layer (SSL) devices, Guardent tested a switch from start-up Nauticus Networks that combines traditional Layer 2 to Layer 3 switching with application-layer switching, and security features such as SSL acceleration.

Nauticus says its N2000 and N2000V intelligent switches will help customers reduce costs and improve data center performance.

The ability to combine functions in one device was something Bob Antia, vice president of quality and risk at Guardent in Waltham, Mass., was especially interested in.

"Combining [load balancing and SSL accel-

eration] in one box makes it easier to maintain and easier to operate," he says. "And fewer components mean more reliability."

Antia says he's been impressed with the N2000, which has run highly secure applications without taking a hit on performance. Because of security issues, Antia wouldn't specify how the switch is being used.

Competing products from companies such as Radware and F5 Networks, which offer load balancing and SSL acceleration in a single device, "don't have the throughput that the Nauticus box has," he says.

The switches run on Nauticus' TideRunner chipset, built specifically to handle load balancing, SSL acceleration and virtualization, meaning the physical switch can be partitioned into multiple virtual switches. The switches sit behind a data center router and/or alongside existing firewalls.

Because all the processing is done in hardware, the switches can do application-level switching and packet inspection without taking a hit on performance, the company says.

"We have the ability to really secure your site without any loss of performance, which has been the bane of people using SSL. It's very costly and very difficult to run. We solved many of those problems," says Josh Weiss, president and CEO of Nauticus.

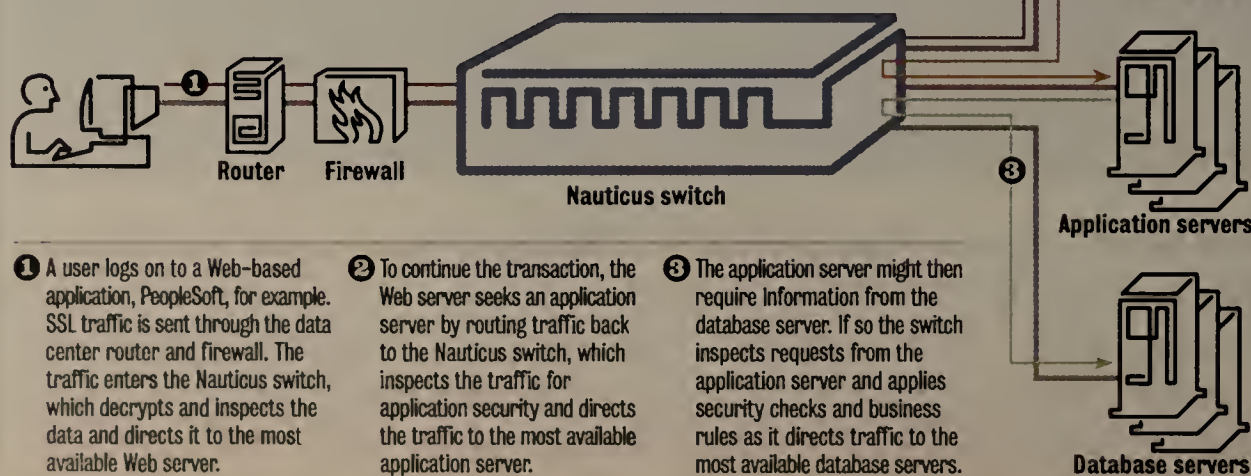
Zeus Kerravala, an analyst at The Yankee Group, says the concept behind the Nauticus switches is sound, especially for companies in the healthcare and financial industries, where secure applications are widely used. But he questions whether they will have widespread appeal, especially with technology spending at a minimum these days. As for their virtualization capabilities, Kerravala suspects users might not yet be ready for such a drastic change in their data centers.

With the N2000V, companies can create virtual switches within one physical device. Each switch can have its own bandwidth, policies and management, and can be used to direct traffic to the most available server in a data center. Without virtual switches, companies would have to use separate load balancers or hardwire their architectures.

The N2000 and the N2000V come with two LAN configurations: 40 10/100M bit/sec ports plus four Gigabit Ethernet ports or with just 12 Gigabit Ethernet ports. The N2000V includes virtualization capabilities. Pricing starts at \$25,000 for the N2000 and \$35,000 for the N2000V. ■

Sharing the load

Nauticus' virtual switching technology lets customers add network and security services to multiple data center servers, enabling resources to be shared across the data center.



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Apps

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who is available via what media.

The XP-based portal includes click-to-contact features, letting phone or video calls, chat sessions or e-mails be placed by clicking on names in a Microsoft Active Directory-based listing. Conferences can be established by clicking on multiple names. OpenScape has integrated support for WebEx's Internet-based whiteboard and document sharing service.

At the heart of the suite is unified messaging middleware that runs on Microsoft's soon to be released Greenwich Real Time Communications (RTC) server above Windows 2003 Server. An integrated SIP gateway makes it possible to interface OpenScape to IP and traditional telephony systems from Siemens and other vendors, even if they are not SIP-based, says Mark Straton, senior vice president of global marketing at Siemens Information and Communication Networks.

OpenScape is in alpha testing now, with a beta-test version due next month. It will be generally available in the third quarter for about \$250 per seat.

With the release of OpenScape, "Siemens is trying to recraft itself into more of a software company, as opposed to a traditional PBX maker," says Brian Riggs, a senior analyst at Current Analysis.

This approach is a trend among other PBX vendors, such as Avaya, Nortel and Alcatel, he says, as they position themselves to compete with Cisco, whose strategy relies entirely on IP and convergence applications.

Basing OpenScape on SIP was a good move by Siemens, Riggs says, but it raises the question of when, or if, the company will fully integrate the protocol into its HiPath IP PBX line, which uses a mix of proprietary protocols and H.323 for call control.

He adds that OpenScape is a good start, because it separates Siemens from its rivals, who have been slow to release SIP-based gear: "Implementing SIP halfway is more than what a lot of other vendors have done."

Although Microsoft wasn't talking applications, it did showcase development tools for the forthcoming Windows CE .Net 4.2 that will let manufacturers integrate voice support into IP-based clients.

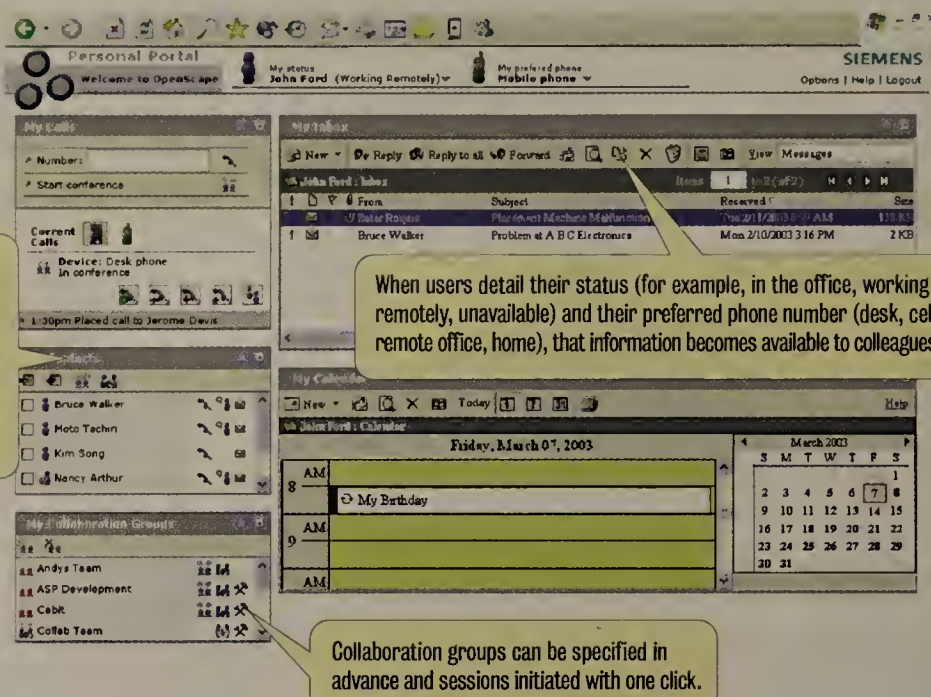
Ultimately Windows CE-based IP phones and other devices might be able to place calls over wireless LANs, according to Scott Horn, director of the Embedded and Appliance Platforms Group at Microsoft.

Microsoft will provide in Win CE 4.2 a telephony user interface that can be used to build features such as custom telephony application interfaces.

The software also includes a VoIP Application Interface Layer, an application suite and a set of APIs that support SIP. This

SIP-based convergence

Siemens' SIP-based OpenScape software, based on Microsoft's Greenwich RTC server and Active Directory, gives end users a portal for tying together communications technologies:



Buddy list indicates whether colleagues are available via e-mail, chat, voice or video, and supports click to dial and click to conference.

When users detail their status (for example, in the office, working remotely, unavailable) and their preferred phone number (desk, cell, remote office, home), that information becomes available to colleagues.

Collaboration groups can be specified in advance and sessions initiated with one click.

will allow devices based on Win CE 4.2 to serve as clients to Microsoft's Greenwich RTC server.

The Win CE 4.2 software, which is scheduled to ship this summer, also will include Enterprise Infrastructure Integration services intended to simplify the integration of computer telephony software and enterprise applications.

Microsoft hopes Win CE 4.2 will foster the integration of data and voice, and provide capabilities such as managing voice mail and e-mail from a single device or creating voice-driven interfaces to back-end services such as databases.

This recent movement to integrate SIP support in applications is a positive development, Mark Katsouros, communications automation engineer at the University of Maryland in College Park, said after the show.

"SIP seems to be the most efficient way of implementing VoIP," Katsouros said. "It has a lot of advantages over proprietary protocols" and older VoIP standards, promising improved interoperability and capabilities that extend to other types of messaging beyond voice.

"As the technology develops, you'll see [VoIP] creeping out more to the edge in the form of IP phones and applications on desktops," he adds.

Other announcements at the show relating to SIP and VoIP technology included:

- A SIP-based multipoint control unit from RadVision — the VialP MCU — for controlling videoconferencing sessions among SIP-based Windows Messenger clients.

- Polycom's SIP-based SoundStation IP telephone, with support for multiple lines, and enhanced sound quality through embedded quality-of-service mechanisms.

- Citel's Citelink IP Handset Gateway, which could be used to let digital Nortel

phone handsets receive SIP-based IP-based IP Centrex services from carriers. The product was announced with support from softswitch maker Sylantro Systems.

SIP, today and tomorrow

One expert speaking at VON said the increase of SIP applications is a good start but we've only scratched the surface.

In a VON keynote presentation, Henning Schulzrinne, associate professor of computer science and electrical engineering at Columbia University and co-author of the IETF RFC outlining SIP, said SIP's contribution would be its ubiquity. It will be integrated into all kinds of software and become as much a part of enterprise applications as TCP/IP. "If you are waiting for a killer app for SIP, you will be waiting until you are dead."

Most interpretations of SIP are too telephony-centric, Schulzrinne said. It's possible, for example, to add SIP-based real-time communications and voice features to Web browsers or build in presence or chat interfaces to ERP applications.

Adding such services to network applications will become easier as SIP adoption progresses. "We need to get away from the notion that services are created by specialists," Schulzrinne says. Tools are needed that can allow SIP services and applications to be deployed on a model similar to creating personal home pages.

As for the gains SIP has already made, Schulzrinne said the development of low-cost SIP devices — such as phones and PC software — have made the technology more accessible. "We are getting to the point where you don't have to put on desktops a PC-equivalent device — in terms of cost — in order to deploy SIP."

He also discussed improvements in SIP voice quality, mentioning tests done at

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Management

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15 independent software vendors. Tivoli executives say third-party vendors such as SAP can potentially integrate the automatic engine into their products and sell it directly to corporate users. And network managers can buy it as a stand-alone product and tailor the software to their networks.

Tivoli competitors BMC, Computer Associates and HP are expected to announce similar product road maps soon: BMC this week, the others at their user conferences this summer.

BMC's plan

Fresh off its \$42 million acquisition of IT Masters, BMC this week will lay out its strategy for Business Service Management. The company, which last year acquired Remedy, a service and help desk software vendor, says with IT Masters' MasterCell software it can now offer enterprise network managers integrated service management. MasterCell correlates events and model service performance, which will complement BMC's Patrol application and systems management portfolio.

BMC says it will incorporate technology across its software lines that will take cues from predefined rules and detect potential failures in devices or applications. The products expected to first include the MasterCell, Remedy and Patrol integration would be help desk, storage, data, asset, event and change management software. The company says linking the data collected by those products will enable the software to dynamically update service-level agreements, detect when SLAs might be missed and take measures to prevent that.

BMC's acquisitions will add to the company's ability to track and graphically display system and application performance, says Rich Ptak, president of Ptak & Associates. Ptak says BMC clearly is focusing its efforts on service management. The company last month eliminated part of its storage management line and reallocated staff to its service management team. The newly honed focus will let BMC put intelligence into its products that improves management features and eases user implementations.

"Management vendors went from managing devices in isolation to collecting a lot of data from everything without linking it in a meaningful way to now at least understanding what customers need to do," Ptak says. "It's a slow process, but they are evolving their products to manage the infrastructure based on the business."

BMC plans to deliver products based on its Business Service Management strategy in the coming months. ■



Network Management

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Columbia in which SIP-to-SIP performance was better than cell phone-to-TDM phone links in terms of milliseconds of delay.

Proprietary? Not me!

While the promise of SIP was touted widely at VON, the practical adoption of standards-based protocols and other VoIP interoperability issues were hotly debated at the *Network World* IP PBX Showdown, where leading convergence vendors took shots at each other.

The VON Showdown was hosted by *Network World* Editor-in-Chief John Dix and Mike Hommer, consulting manager for Miercom, and included representatives from Alcatel, Avaya, Cisco, Mitel and Nortel (read more about the Showdown, page 40).

As panelists took turns grilling each other over their IP PBX products and strategies, the issue of open protocols — who was using SIP and how much, and the use of proprietary technology — came up frequently. And Cisco took the brunt of the heat.

Jeanne Bayerl, director of product market for Alcatel, brought up Cisco's use of the proprietary Skinny Call Control Protocol (SCCP), and asked why the vendor did not embrace open standards more.

"Cisco fully supports open standards," said Bill King, technical marketing manager at Cisco. He said Cisco phones support H.323, Media Gateway Control Protocol and SIP, and said the company supports SIP-based gateways and proxy servers, adding "we've shipped more SIP-based products than any other vendor up here." He also said Cisco's SCCP is licensed to partners — such as Polycom and Spectralink — and is not as proprietary as critics make it out to be.

Each vendor endorsed SIP as a strategy. Alcatel and Mitel said their IP PBXs could run SIP natively, while Avaya, Cisco and Nortel all said broader SIP support for their gear was in the works.

Avaya and Mitel brought up the closed protocol. Mack Leathurby, Avaya's director of converged system and unified communication applications, mentioned Cisco's use of its proprietary Cisco Discovery Protocol as an integral management function, such as an initializing inline power, for its CallManager IP telephony system.

"All vendors use some proprietary protocols," Cisco's King said, adding that closed protocols are used to add features that standards such as SIP and H.323 fall short of. And firing back at Avaya's Leathurby, King added, "I haven't seen Avaya working to make available its [Digital Communications Protocol]," which Avaya uses in

addition to H.323 for adding features to its IP phones.

— Senior Editor John Fontana contributed to this story.



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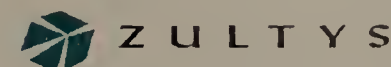
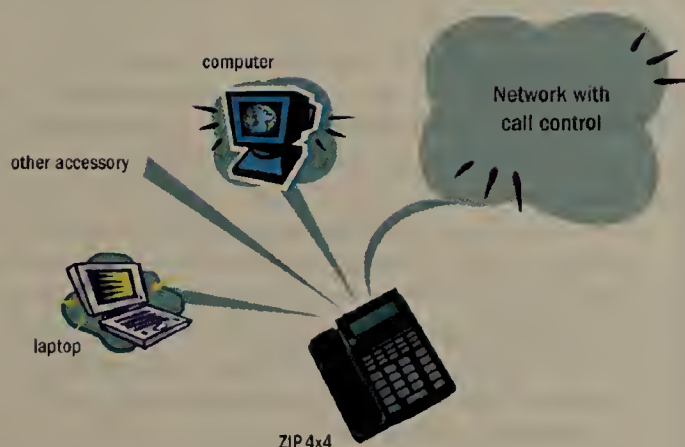
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To learn how the ZIP4x4 can be rapidly deployed, simplify your desktop, and enhance productivity, call us or access our web site.

Corrections

■ In the story "Disk saves the day," (March 24, editorial supplement, page 8) *Network World* was supplied with incorrect information. If you look at back-up and restore times when comparing disk and tape, you will find that they vary greatly from theoretical figures to those achieved in real-world situations. The story has been corrected online to accurately reflect what users will see in their environments (www.nwfusion.com, DocFinder: 5042).

■ The story "Nortel, Vernier pitch new wireless LAN product," (March 31, page 13) should have stated that the AM 6500p and IS 6500p are expandable to 12 ports. Also, the pricing for the Nortel Access Point 2220 should have been listed as \$900.



ZULTYS

Competition forces HP to slash prices

■ BY JENNIFER MEARS

PALO ALTO — In an effort to improve its position in the mid-range Unix server market, HP is cutting prices on its core offerings by about 20%, rolling out enhanced customization options and expanding its server capacity-on-demand program.

HP last Thursday announced price reductions for its HP 9000 midrange Unix servers, which includes the 16-processor rp8400 and the eight-processor rp7410 and rp7405. HP also reduced prices on components such as CPU and memory, as well as support by as much as 25%.

The company also is expanding customization options for customers and is taking its on-demand services a step further by offering cell boards and memory on an as-needed basis. Cell boards are what the memory and processors plug into and can hold up to four processors and 16G bytes of memory. In the past, customers had to pay for cell boards and memory that supported all the processors in the box, even if some of those processors were idle standbys.

Downward pressure

Dimitris Dovas, worldwide marketing manager for midrange Unix servers in HP's Business Critical Systems unit, says the moves are in response to increased competition in the mid-range Unix market.

IBM and Sun also reduced server prices earlier this year. HP holds

the No. 1 spot with about 40% of the \$1.9 billion market, according to IDC. IBM is second with 35% of the market, and Sun ranks third with 14%.

"There has been a lot of intense price competition in the mid-range, and average sale prices have fallen," says Jean Bozman, research vice president at IDC.

"With the major vendors competing so intensely with each other and with the average price dropping in the midrange server space, customers are benefiting because they're getting a lot of value for lower prices," Bozman adds.

HP is working to reduce customers' total cost of ownership, and one way of doing that is to let customers pay only for what they use, Dovas says. HP, IBM and Sun all offer some type of on-demand services.

As-needed services

With last week's announcement, HP has extended beyond only offering CPU processing power as needed to offering memory and cell board capabilities on-demand. That means that customers can get servers with idle memory and idle cell boards and activate them as needed to meet spikes in workload, he says.

Customers pay a fee upfront and then pay for the hardware as it is activated, Dovas says.

HP also is taking advantage of increased supply-chain efficiencies in its factories to offer more customization options without additional charge, Dovas says. ■

Merrill

continued from page 1

deploying Web services that open up Merrill Lynch systems to systems outside the firewall, Carey said. Exposing services across the Internet is a low priority — and one that won't get attention until more mature security and management features are available, he said.

In the meantime, Web services is one way Carey plans to glean more value from Merrill Lynch's \$4 billion-a-year technology and services budget, which consumes about 25% of the firm's total expenses. "We've been spending \$4 billion a year for years. We've got to get more out of it," Carey said.

Why UDDI?

Merrill Lynch Chief Technology Architect Rick Carey's reasons for investing in a Universal Description, Discovery and Integration registry:

- To drive Web services adoption by allowing developers to find and reuse existing services.
- To provide developers with information on how to integrate Web services with business processes.
- To allow business partners to easily find and work with Web services.
- To create a central repository of all products and services available inside the firm.
- To make applications more reliable by allowing Web services consumers to automatically discover application changes.

Merrill Lynch wants to get away from its application-centric history of proprietary interfaces, islands of automation and costly integration middleware. The firm has 23,000 legacy mainframe applications in production — a "ridiculous" number, Carey said. Eighty percent of Merrill Lynch's business touches the mainframe, Carey said.

With its current setup, 90 cents of each development dollar was spent resolving infrastructure issues, leaving only 10 cents for building new business functions.

Carey would like to see that ratio upended. The firm is working to get to a service-centric model that takes advantage of Web services tools, its untapped assets and standards-based connections.

For starters, developers at the firm created an application called XML for Merrill Lynch (X4ML) that exposes mainframe transactions — from Merrill Lynch's credit-card processing, corporate Web site and trading systems, for example — as standard Web services interfaces. The COBOL- and Customer Information Control System-based application lets CICS programs participate in Web services by accepting Simple Object Application Protocol requests from the Web, converting the SOAP requests into formats accepted by the legacy programs, and then converting the results of those programs into SOAP responses. X4ML runs completely within CICS, requiring no middle-tier hardware, Carey said.

Regarding its untapped assets, Merrill Lynch is working to achieve better utilization of existing resources. The firm is migrating many of its intranet sites from dedicated Intel-based servers — which typically achieve utilization in the 20% range — to the mainframe running Linux. The mainframe consistently logs utilization in the 75% range, whereas Merrill Lynch was "leaving 80% on the table" with its distributed data centers, Carey said.

When making new IT purchases, the firm insists on standards-based technology so it doesn't get locked in with one vendor. Carey makes it clear to vendors that "the moment you're not the best, we're going to swap you out," he said.

Carey wouldn't disclose how much Merrill Lynch has spent on its Web services initiatives, but he said the new technology has reduced integration project timelines from years to months. Developer productivity is on the rise. Carey is starting to see more of every development dollar go toward building business features — as much as 35 cents as opposed to the 10 cents allocated historically.

The number of CICS applications in production at Merrill Lynch is no longer increasing, and Carey expects it to begin declining as the firm develops more Web services interfaces. Ultimately, maintaining as few as 8,000 or 10,000 CICS apps seems like a reasonable target, he said.

The firm is cautiously enthusiastic about Web services, Carey said. That the two biggest vendors — IBM and Microsoft — are so committed to Web services gives the firm confidence to pursue Web services development. The vendors' alternately cooperative and competitive relationship is advantageous to technology buyers. "I love the relationship between IBM and Microsoft," he said.

"I love that they cooperate at these meetings and then the minute they separate from these meetings they're just back-stabbing each other to death."

To Carey, the two most promising benefits of Web services are development language independence and transport independence. He doesn't want to have to choose between Java2 Platform Enterprise Edition and .Net, for example. "I don't believe in one set of tools for all jobs," he said.

However with regard to transport independence, there's potential but little progress, Carey said. The ubiquitous nature of TCP/IP and interoperable messaging capabilities are important. But he'd like to see support for messaging beyond HTTP. For example, he'd like to be able to use something more reliable, such as IBM's WebSphere MQ messaging platform.

Also missing from the Web services picture are mature security features and quality of service. "We're kind of forgiving of that today," Carey said. "We won't be forgiving of that fairly soon."

Until security improves, Merrill Lynch remains selective about which CICS programs it will expose as Web services. "As an architect, I won't let key information be exposed," he said.

Carey's advice to his peers is to focus on building key centralized services — such as a directory of available Web services based on Universal Description, Discovery and Integration (UDDI) standards — before diving into individual development projects.

A solid UDDI foundation drives Web services adoption and increases developer productivity by allowing developers to find and reuse Web services implementations, he said. It's as key to a healthy Web services infrastructure as a stable DNS system is to network operations, he said.

In hindsight, Carey wishes he had focused on UDDI earlier. "If you let people run amok on UDDI, Web services will fail," Carey said. ■

Falling prices

HP is dropping prices on its midrange Unix server line.

Decrease	Model
20%	rp7410 with eight 750-MHz CPUs and 32G bytes of memory. From \$291,910 to \$233,510.
20%	rp8400 with 16 750-MHz CPUs and 64G bytes of memory. From \$578,600 to \$465,800.
10%	rp7410 with eight 875-MHz CPUs and 32G bytes of memory. From \$339,910 to \$305,510.
10%	rp8400 16 875-MHz CPUs and 64G bytes of memory. From \$674,600 to \$609,800.
15%	rp7405: 2-way configuration. From \$132,595 to \$113,113.
14%	4-way configuration. From \$72,995 to \$62,933.
5%	2-way configuration. From \$43,595 to \$41,600.



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Short Takes

■ IP-storage start-up **Intrinsa** rolled out its first product last week — a storage array that uses Advanced Technology Attachment drives and attaches to the Gigabit Ethernet network. The **IP5000 Storage System** uses the iSCSI protocol to transfer block-oriented storage data over the Ethernet network. It has 3 to 10 terabytes of capacity and is composed of individual storage and disk enclosures that connect through a Layer 2 Gigabit Ethernet switch, ensuring performance and capacity increases without disrupting applications. The storage array ships with a Windows-based graphical management interface that lets storage administrators monitor and administer the device. The management software gives the administrator the ability to change volume size, mirror volumes or add or delete them. A command-line interface also is available. The IP5000 is expected to ship in June for \$62,500 for a 3.2 terabyte system.

■ Newly designed **Compaq Presario** notebook and desktops will provide integrated wireless LAN technology for the 802.11g standard, **HP** said last week. The new Compaq Presario 2500 and 2100 series notebooks are designed to work with wireless networks based on the draft specification of the 802.11g standard, HP said. The integration of 802.11g technology makes the new Presarios better suited for sharing files and viewing digital media. Like Wi-Fi devices that use the 802.11b standard, 802.11g wireless devices operate in the 2.4-GHz band. However, 802.11g devices support faster data transfer rates than those using 802.11b: 54M bit/sec vs. 11M bit/sec. The Presario 2500 is being sold for \$1,200 with a \$100 rebate and comes with Intel Pentium 4 processors, ATI Mobility Radeon integrated graphics card and IEEE-1394 high-speed digital video port. The 2100 series costs \$920 with a \$100 rebate and comes with a Intel Celeron and Mobile Pentium 4-m processors, memory configurations up to 1G byte and a Type I/II/III PC card slot.

Getting Gigabit to desktops

Standard, proprietary technologies on the way to speed PC buses.

■ BY PHIL HOCHMUTH

Dramatic price drops on copper Gigabit Ethernet network interface cards and switch ports have caused many network professionals to take notice. But because many PCI-based desktop machines were not built for Gigabit-speed LANs, those users serious about migrating to high-speed PCs might have to upgrade more than NICs and wiring closet switches, some say.

"There are many efforts to get Gigabit Ethernet into the client area, and it will probably soon be a check-box item for enterprise IT staffs," says Tony Pierce, chairman of the PCI Special Interest Group (PCI-SIG), a standards development group responsible for the PCI technology design.



Part of the attraction of Gigabit to desktops is the proliferation of inexpensive Gigabit NICs, with many available for less than \$100. Switch vendors also are pushing copper-Gigabit desktop links, as Cisco last

week released high-density 10/100/1000M bit/sec switch modules for its Catalyst 6500 switch, aimed at large wiring closet deployments. PC vendors such as Apple, Dell and HP also offer 10/100/1000M bit/sec ports integrated into their desktops.

For users thinking of slapping in 10/100/1000Base-T NICs on older desktops, Pierce warns "you will get better performance on those systems, but not at the level that you'd expect, and for the added expense you will pay for upgrading to Gigabit. A lot of it depends on system configuration."

The issues lie with the PCI shared bus architecture, which has a total bandwidth of 133M byte/sec between peripheral cards and the processor and memory.

"The laws of physics tell you that you're not going to get full-duplex Gigabit Ethernet throughput," on older PCI systems, Pierce adds.

He says newer bus architecture technologies — such as PCI-X and PCI Express — are starting to catch on in server connections and will trickle down to PCs.

PCI has long been the standard bus interface for connecting devices such as NICs, RAID controllers, modems and other peripheral cards to PCs and servers. PCI-X 1.0 was introduced in 2000 as an extension of PC, increasing bus speed to 133 MHz. PCI-X 2.0 was introduced soon after PCI-X, offering higher bus speeds, from 266 MHz to 533 MHz. Last year, the PCI-X 1066 specification — a 1066 MHz bus with 8G byte/sec of

See Gigabit, page 18

Fortinet uncorks security mgmt. app

■ BY TIM GREENE

SANTA CLARA — Fortinet this week is introducing a management appliance that claims to make it simpler for customers to configure, create policies for and administer the large groups of the company's multifaceted FortiGate security appliances.

Called FortiManager, the appliance can manage 5,000 security appliances, which include firewall, VPN, antivirus, intrusion-detection, content-filtering and traffic-shaping software.

The FortiGate security appliances monitor traffic at the junction of the WAN and LAN where they enforce policies on packets. Using a graphical interface on the FortiManager appliance, users can set policies for any security applications the device supports.

Each FortiManager can be accessed by up to 12 separate Java-based consoles so multiple administrators can use the box at the same time. The device also can be divided into different management domains, with each domain limited to a subset of the FortiGate security appliances being managed. This lets network executives give access only to certain administrators, for example, to the FortiGate that

guards a corporate server farm, while a larger group might have access to those FortiGates at remote sites.

Previously, customers managed FortiGate boxes one at a time via Secure HTTP Web interfaces. "That's fine if you have a few boxes, but that's not fine if you have a lot of



Fortinet's FortiManager appliance can manage up to 5,000 other devices.

them," says Michel Merle, regional manager for PSINet-France, which beta-tested the new gear. He says it enables setting up restricted access for users that want authority to shape traffic so, for example, videoconferences have enough bandwidth, but not to alter firewall settings.

Merle says the device could benefit from a tool that lets users create policy templates such as time-of-day restrictions for use of peer-to-peer applications. That would make it even simpler to configure large numbers of FortiGate appliances, he says.

The common management platform for the multiple functions that the FortiGate

boxes support can reduce the amount of training IT staffs need to learn management platforms. Using the multifunction boxes also cuts the setup costs vs. buying separate security wares, says Eric Ogren, an analyst with The Yankee Group.

Matthew Kovar, another analyst with The Yankee Group, says the Fortinet gear falls into a category of equipment he calls security switches. Competitors include Crossbeam, Symantec and TippingPoint Technologies. Such equipment performs deep packet inspection, then imposes multiple policies that can be based on any network layer. So the device can perform as a network-layer firewall, but also screen for banned content at Layer 7 based on an examination of a packet.

Fortinet says it will upgrade FortiGate appliances, later this year so each can support multiple virtual systems, meaning each device can support multiple security policies for the same application. For instance, one FortiGate could have two sets of firewall policies, one for a server farm and one for corporate desktops.

Pricing for FortiManager starts at \$12,000 for a box that supports 25 FortiGate units and ranges to \$53,000 for one that supports 1,000 units. ■

WIRED
WINDOWSDave
Kearns

Every day is Valentine's Day

talking about the Windows operating system, hasn't he?

I first came across young Valentine in the late 1980s when he was a brash new engineering manager in Microsoft's networking area (LANManager at the time). I was a volunteer system operator for Novell's NetWare forum on CompuServe. A new voice had started swooping into the NetWare forum and promoting this new network operating system from Microsoft, which, of course, fueled the wrath of the NetWare faithful.

A little investigation showed that the messages were originating inside Microsoft. A little further investigation (and thanks to some friends who were volunteers in the Microsoft forums on CompuServe), the identity of the poster, one Brian Valentine, was exposed. Did he slink off with his tail between his legs? If you even thought that, then you don't know him.

Rather, he continued to laud "his" network operating system while, all the time, learning more about NetWare than anyone except those actually working for Novell. The culmination of all this was a planned appearance by Valentine at the annual NetWare pub crawl at Dick's Last Resort during that fall's NetWorld-Dallas trade show. There were a few hundred people there that night, partially for lead system operator John McCann's bachelor party, but many just wanted to see if Valentine would show up. Not only did he show up, but he stole the show with his gifts of Microsoft network products for all of the NetWare system operators.

he next time you think Valentine's mouth is getting him in trouble, take another look at the result.

Kearns, a former network administrator,

is a freelance writer and consultant in Silicon Valley. He can be reached at wired@vquill.com.

Tip of the Week

I won't be joining you next week in Salt Lake City for **BrainShare**. For the first time since 1987, I won't be on hand for this gathering of the NetWare faithful. But it's just a one year hiatus; I'll be back next year. Do be sure to drop me a note telling me all about your impressions of the show.

Gigabit

continued from page 17

bandwidth — was launched. PCI-X 1.0 and 2.0 are used mostly in servers and some desktops.

Ultimately, the emerging PCI Express will be the standard bus architecture of choice for desktops and servers, Pierce says. That architecture promises up to 16G byte/sec, or 128G bit/sec, with a fully switched architecture. The advantage is similar advantages of switched Ethernet over shared hubs.

The here and now of PCI

For now, PCI-X 1.0 is used more widely on servers and some newer PCs, but the technology is not as widespread as standard PCI, Pierce says. And because mass adoption of the newer PCI variants probably won't happen until next year, some vendors have created proprietary methods for making PCs and servers Gigabit-ready.

Intel recently released its Communications Streaming Architecture, which is an I/O technology that bypasses 32-bit, 33 MHz PCI bus systems and allows full duplex Gigabit Ethernet support for Intel NICs.

"With PCI and Gigabit Ethernet NICs, you have a very high-speed connection that's forced to share bandwidth with other slots on the bus," says Tim Helms, vice president of Intel's communications group and general manager for its platform networking group. "We've removed the PCI bottleneck by offloading the LAN traffic from the PCI bus, to give it direct access to system resources."

Helms says the new technology lets PCI-based systems push up to

1.7G bit/sec of bandwidth between the NIC and system memory and processor, up from about 928M bit/sec, which was the previous top performance on an optimally configured Intel PC or server.

"There are some technology that help improve Gigabit Ethernet performance on a PCI bus, but they are proprietary," PCI-SIG's Pierce says. "Some of these proprietary efforts were created due to the lack of a high-speed I/O standard that is widely available."

While there will be users with immediate needs for full-Gigabit performance on PCI systems, ultimately standards support for a faster I/O technology will be more important to companies, Pierce says. By the time widespread demand for Gigabit desktops occurs, which he expects over the next few years, standards such as PCI-X 2.0, PCI-X 1066 and PCI Express will be available from equipment makers.

"In a few years, you will proba-

bly be looking at PCI-X or PCI Express as a replacement for most desktop systems," he adds.

Subbig good enough for some

While technology options vary and new standards are under development, users who have installed Gigabit desktop connections today say the performance is adequate.

Aperio Technologies, a San Diego company that develops high-resolution scanning technology for microscope slides, uses Gigabit Ethernet NICs in its PCI-based desktops for moving large image files around its network.

"It's a little slower than full Gigabit, like you would expect," Ole Eichorn, CTO at Aperio.

"It still blows Fast Ethernet away," he says, adding that he sees about 500M to 800M bit/sec data transfer rates between some machines. "When you're moving a 2 gigabyte file from a PC to a server, [Gigabit Ethernet] is a nice thing to have."

At Case Western Reserve University in Cleveland, the new facility for the business school was built with 10/100/1000M bit/sec ports to every office, classroom seat and common area in the building. Many students use school-issued Dell laptops with 10/100/1000M bit/sec cards, and faculty members use a mix of PCs and Macs with Gigabit built in.

"We're not getting full Gigabit throughput, but we're seeing about 80% to 85%, which is pretty good," says Lev Gonick, CIO and vice president of IS.

Gonick says students use the Gigabit connections mainly to access the school's large library of multimedia materials hosted on servers in its data center. ■

SuSE Linux desktop slated for June debut

■ BY JUAN CARLOS PEREZ

Looking to brighten the allure of having Linux on enterprise desktops, SuSE Linux last week said it plans to ship its SuSE Linux Enterprise Desktop operating system in June, a delay from original plans to ship it during the first quarter, which just ended.

With many companies using Microsoft Windows as a client to SuSE Linux's server operating system, SuSE Linux Enterprise Desktop will offer those companies an option to run SuSE software on the desktop as well.

SuSE Linux Enterprise Desktop, which is in beta testing now, will cost \$130 per desktop, although discounts would apply to high-volume purchases, says Rafael Laguna, SuSE's marketing vice president.

SuSE Linux Enterprise Desktop would be the company's third desktop operating system, joining SuSE Linux, the entry-level member of the family aimed at individual users, and SuSE Linux Office Desktop, aimed at small offices with its network and disk-partitioning capabilities, he says.

SuSE Linux Enterprise Desktop

will share the code base with SuSE's other desktop and server operating systems, which gives users a high degree of compatibility across the company's line of operating systems, Laguna says.

SuSE Linux Enterprise Desktop will be tuned for companies and government agencies that have from as few as 10 users to as many as 100,000-plus users, Laguna says.

Consequently, it will be engineered for easy, automated, centralized large-scale deployment and management through administration and installation tools from SuSE, such as YaST (Yet another Setup Tool) and AutoYaST, and from third-party vendors, such as Ximian's Red Carpet Enterprise.

It also will feature fonts that are metric-compatible with Microsoft fonts, which will make it easier to import Office documents, Laguna says.

The product will ship standard with one year of maintenance and support, which gives users access to patches, product updates and security fixes; buyers can opt to pay extra for additional years of maintenance and support, he says.

The company plans to provide more details about the product when it announces it in May.

Perez is a correspondent with the IDG News Service's Latin America bureau.

Getting off the bus

Faster I/O standards are under development for letting PCs and servers use a full Gigabit Ethernet pipe.

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- PCI-X: from 2G to 4G byte/sec per slot.

Coming soon

- PCI-X 1066: up to 8G byte/sec per slot.
- PCI Express (formerly 3GIO): up to 16G byte/sec per slot.



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Special Focus

INFRASTRUCTURE: The ubiquitous VPN.

Microsoft set to boost Win Server VPN offerings

■ BY TIM GREENE

When Microsoft wheels out Windows Server 2003 this month, the company will address some shortcomings of its embedded VPN technology, making the software more attractive to users looking to save money connecting remote sites over the Internet.

While the company has included VPN capabilities for free in its PC platforms as far back as Windows 98, other vendors — Check Point, Cisco, NetScreen Technologies, Nokia and Nortel — perennially have beaten Microsoft in sales of VPN gear. Upgrades in Windows Server 2003 improve Microsoft's clients and servers. Notably, the new software will introduce features such as denial of access to the VPN if the PC trying to connect to it isn't configured with the right set of security applications such as firewalls and antivirus software. The package also will expand the ability to move VPN traffic through firewalls and make stronger authentication methods possible.

Many vendors already supply these features, so Microsoft is playing catch-up. But Microsoft's widespread use is an advantage that others don't have. The company's NT, 2000 and 2003 servers can function as VPN gateways to terminate VPN sessions. Client support is available via Windows 98, ME, 2000 Professional and XP Pro. VPN gateways from Cisco, Enterasys Networks, Nortel and NetScreen support Microsoft VPN clients. Check Point says it will soon offer VPN gateways that support Microsoft VPN clients.

"The [thing] is not having to touch every laptop. If they have [a Windows operating system], they have basic VPN features built in. No other vendor can say that," says Joel Snyder, a senior partner with Opus One and a member of Network World's Global Test Alliance.

Microsoft VPN server software could be a moneysaver for small companies by having their servers do double duty as an internal server and WAN gateway. "I'd say [it's attractive to] small enterprises who have committed to Windows 2000 at their remote offices and who have significant training in Microsoft products as well as a good solid Active Directory implementation," Snyder says.

The VPN capabilities that come with Windows Server platform are attractive, but aren't necessarily the most feature-rich, experts say. For instance, the ability for VPN traffic to cross firewalls that perform network address translation (NAT) is a common feature of most VPN appliances and their custom clients, but something that Microsoft still is developing.

Microsoft has hired SafeNet to write upgrades for Windows 98, 2000 and ME clients so they will support NAT, and Microsoft has made its own NAT upgrades for Windows 2000 and Windows XP that will be ready in about two months, says Mike Chan, technical product manager for Microsoft VPN.

Firewalls commonly change the private IP addresses

on a LAN to a public IP address for traffic that crosses the Internet so it can be routed properly. NAT is also a way to mask the private network IP address structure from public inspection as a way to thwart hackers. Microsoft has had server support of NAT, but it is not as robust as other vendors', Snyder says.

While NAT is key to setting up VPNs, users also seek more secure ways to ensure that remote users are authorized to log on to the VPN. With Windows Server 2003, Microsoft is making it easier to use public-key infrastructure (PKI), a more stringent machine authentication method that ultimately makes it harder to crack encryption.

Rather than use one set of keys to encrypt and decrypt traffic, customers can use a pair of public and private keys with PKI. But to set this up securely, the machines involved first must be authorized. Windows Server 2003 adds a certificate authority that issues digital certificates

ware or their personal firewalls aren't turned on, for instance, the server would reject the VPN session. Users can get a prompt to update their machines or be forwarded automatically to a Web site where they can download whatever updates they need.

Quarantine is set up through a Windows Server 2003 deployment wizard called Connection Manager Administration Kit (CMAK), a 30-pane wizard for setting up VPN clients. CMAK asks for the IP address of the VPN server, a name for that connection, the authentication type to use and a few other parameters. This process creates an executable file called a connectoid to be sent to remote machines via the Web or floppy or Microsoft's Systems Management Server. The connectoid self-installs and is compatible with Windows 98 clients and later.

Many VPN vendors offer this feature via alliances with makers of remote policy enforcement software such as InfoExpress, Sygate and Zone Labs.

Microsoft's VPN architecture varies from other vendors that focus on IP Security (IPSec) as their core technology. The Microsoft method uses only standards-based technologies, hence its hybrid nature, Chan says.

The software supports Point-to-Point Tunneling Protocol (PPTP), IPSec and Layer 2 Tunneling Protocol running over IPSec (L2TP/IPSec), and each has different uses. PPTP is for small organizations that want to set up remote access easily and quickly, Chan says. This is done via ISA server and can be configured in minutes. It doesn't require digital certificates, and all Microsoft clients support it.

L2TP/IPSec is a more secure method — Microsoft says the

most secure — of creating remote-access VPNs. L2TP provides a standard method of authenticating the user, while an IPSec tunnel is used to carry the encrypted traffic.

IPSec is intended for connecting server to server for site-to-site VPNs that let many users at one site tunnel through to resources at the other.

Windows Server 2003 has a number of other VPN-related features:

- It will store VPN logs in XML format, making it easier to sort and format the data in different ways.
- It adds clustering to the features of its Remote Authentication Dial-In User Service server called Internet Authentication Service (IAS). IAS can be installed on separate hardware platforms so if one box fails, authentication for the VPN remains intact.
- It combines technologies in IAS, Active Directory and Remote Access Server to recognize and admit guest VPN users to a limited subset of the network, making it easier to set up temporary access for business partners.

Microsoft also is getting ready to add a second type of VPN to its client for PDAs. Currently the client supports only PPTP VPNs, but the new version will add L2TP/IPSec support to its Pocket PC platform. ■

Microsoft VPN not for everybody

The VPN capabilities that come with Microsoft client and server software don't address the needs of all corporate customers.

Pros

- Save money at small and branch offices by using the LAN server as the VPN server.
- IT staff trained in Microsoft can readily pick up the necessary VPN skills.
- Remote-access clients already are distributed with the operating system.
- Good integration with Active Directory for distributing clients.
- Client works with Cisco, NetScreen and other major VPN vendors.

Cons

- Network address translation is finicky with clients in some modes.
- Requires separate server box if security dictates against external traffic using an internal server.
- Requires a full Active Directory implementation.
- Its most secure mode — L2TP/IPSec — is challenging to configure.

to the machines so their identity can be proven before admitting them to a VPN.

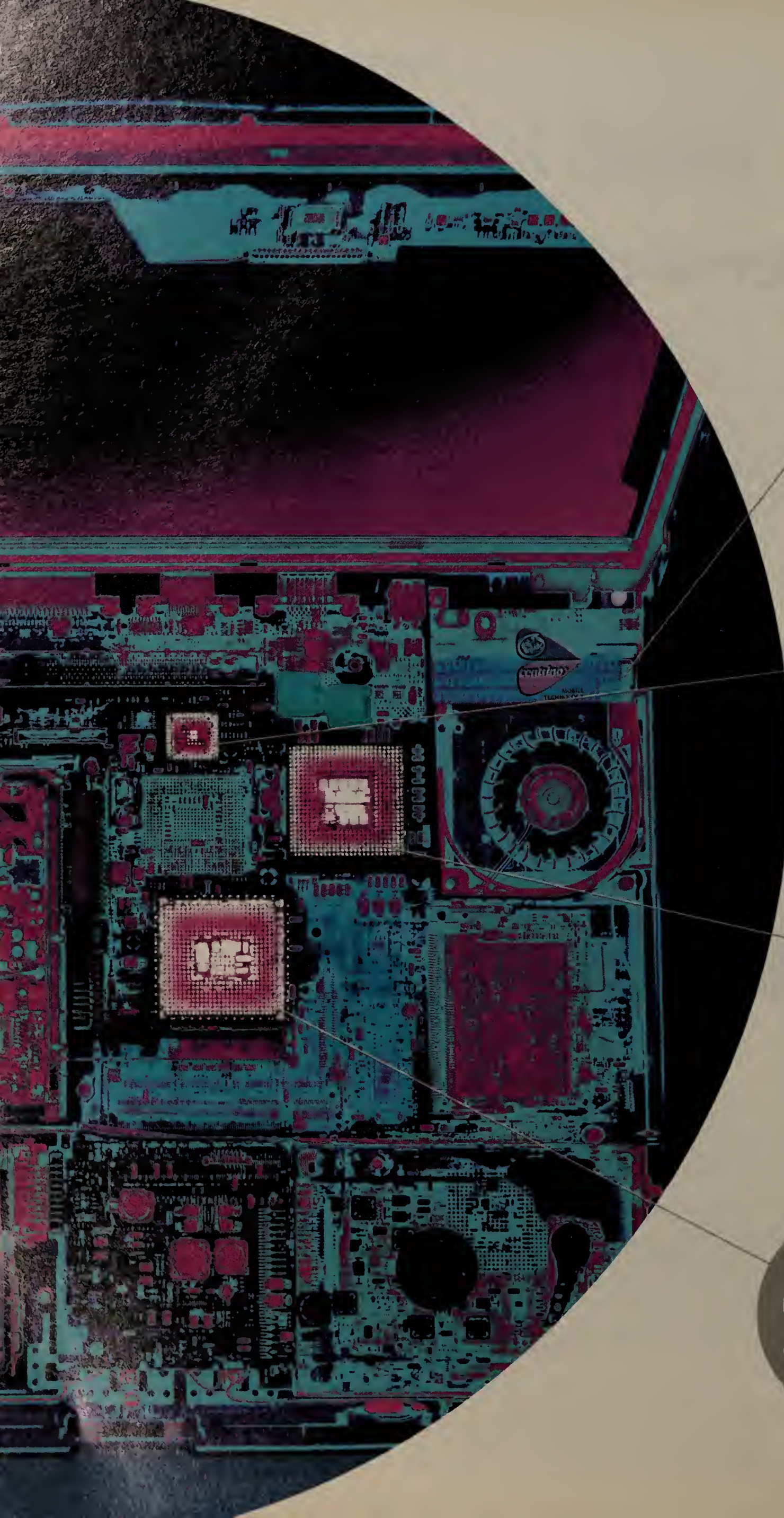
Having its own certificate authority is an improvement over the method that Microsoft servers currently use to support certificates, says Benny Frederiksen, a support engineer for VPN appliance vendor Intermate. "You have to install a Windows 2000 certificate server if you want to use certificates," he says, making the network more complex.

Windows Server 2003 also supports more ways to authenticate not just the machine but the person who is trying to log on to the VPN. By adding support for Extensible Authentication Protocol (EAP), Windows Server 2003 lets users employ such methods as smart-card tokens that also require a user's PIN. This two-factor authentication is considered more secure than simply username and password. EAP is a framework that allows negotiating what authentication mechanism will be used.

A feature called Quarantine is another safeguard being added to Windows Server 2003 to protect the VPN before a user is admitted. Quarantine denies VPN access to remote machines if the boxes aren't configured properly. So if the machines don't have updated antivirus soft-



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Short Takes

■ **Staffware PLC** and **Fujitsu Software** will soon release new versions of their business process management software suites. **Staffware Process Suite Version 2 SPS** is a modular set of applications for running, modeling and managing business processes such as staff tasks and supplier interactions. A key new feature in SPS 2 is Dynamic Process Orchestration, which lets different processes be called up on the fly in response to signals from other applications and events. The technology lets designers draw on predictive features to control complex processes, rather than having to hard-wire all possible process coordination steps, Staffware says. SPS 2's price varies depending on a project's size and configuration, but it starts at about \$100,000. Meanwhile, Fujitsu Software this week will release the latest edition of its **Interstage i-Flow Web-based BPM engine**. I-Flow 6.0 adds new analytics features, along with improved error handling, simplified forms-creation technology, and a tool for creating and modifying encoded business rules without having to write additional code, Fujitsu says.

■ As government rules increase the burden on companies to better track and manage information, content management vendors are stepping up their records management capabilities. **Documentum** this week is releasing **Enterprise Records Management Edition**, software that treats all content — from electronic documents to paper files — as records. Businesses can then set rules as to how the records should be archived or destroyed, based on corporate, regulatory or legal requirements. Enterprise Records Management Edition uses technology Documentum gained with the acquisition of records management firm TrueArc last fall. Documentum also says the records management product can be integrated with online storage products from companies such as EMC. Enterprise Records Management Edition costs \$30,000.

Q & A



Andreessen assesses browser prospects

Ten years ago this month, a team of programmers at the University of Illinois' National Center for Supercomputing Applications loaded a program on an FTP server that could be accessed by almost anyone on the Internet.

Mosaic was the culmination of work launched about six

months earlier by NCSA researchers Marc Andreessen and Eric Bina. Within a year, there were millions of Mosaic users worldwide.

Andreessen, the quintessential Internet programmer, is the board chairman of Opsware, formerly Loudcloud, a Sunnyvale, Calif., vendor of data center management software. He talked recently about the future, present and past of the

Web browser with Network World Senior Editor John Cox.

What have been the main results of the invention of the Web browser?

The big result is that the browser makes it possible to create Web sites. In the early months, there was very little content to actually view. It wasn't like you had Time magazine online. But it also made it very easy for people to view what was there. We went to 10,000 Mosaic users quickly, and to 100,000 in about three or four months. And the number of Web sites [available to be viewed] tracked the same way. It was the network effect, a snowballing. And it still is [continuing]. The browser catalyzed all that in the first place.

OK, so the future of the Web browser is what?

After 10 years, it's still a user sitting in front of a Web browser viewing HTML services. It's not [about] XML, Java applets, the semantic Web. It's HTML and some JavaScript.

See Andreessen, page 26

Recovery tool targets Win OS failures

■ BY JOHN FONTANA

AUSTIN, TEXAS — It's the first thought after a system crash: Has any data been lost?

Winternals thinks it can ease the panic with Recovery Manager, software that targets operating system failures on Windows servers and desktops. Recovery Manager, introduced last week, lets administrators access and recover unstable or unbootable systems via the network from a single console.

Recovery Manager is not a replacement for traditional system-recovery tools such as re-imaging and tape backup, but a lightweight option that targets operating system failures on Windows Server 2003, XP, 2000 and NT4.

While traditional tools will restore systems to the last backup, Recovery Manager will recapture a hard disk's data back to the last time a Save command was executed, according to Winternals officials.

"There is general dissatisfaction with current [recovery] products in that they can be hard to deploy, maintain and use," says Ray Paquet, an analyst with Gartner. "Winternals is trying to ease that by focusing on recovery of the [operating system]." But Paquet says that Recovery Manager

Backup and deploy

As companies move away from worrying about how long it takes to back up data to how quickly systems can be restored, they will begin to deploy replications and point-in-time copying as recovery options for critical applications, according to Gartner.

solves only a piece of the recovery puzzle in that it focuses solely on recovering the operating system and not specific applications or data.

But Winternals says that 70% of the causes of downtime in Windows-based systems are rooted in the operating system and therefore Recovery Manager can clean up the mess faster than traditional tools.

Recovery Manager competes with similar software from Aelita, Altiris and Veritas. The software uses what it calls Recovery Points, which are copies of a machine's system

and configuration files including a copy of the Windows Registry. An agent that is sent by Recovery Manager to the target server or desktop collects the Recovery Points. The agent inventories the complete system the first time it visits a machine and sends the data to a central repository. On following visits, the agent only records changes made since the last Recovery Point. The agent uninstalls itself after every collection and does not live on the target system.

Recovery Points are used to restore a system if it goes down. They are similar to the System Restore feature of Windows XP, but that tool doesn't let users restore an unbootable system. Recovery Manager can be using its Recovery Manager Boot client.

The boot client can be run from the start-up menu, CD-ROM or a network boot. Recovery Manager also features a Recovery Wizard that lets users roll back changes, perform custom repairs focused on known problems such as corrupted files, change passwords or create boot clients on a machine. The Wizard also can produce reports on system changes and uncover what caused a problem. The software also includes a management console that integrates with Active Directory.

Recovery Manager costs \$300 per server and \$30 per workstation. ■

NET
INSIDERScott
Bradner

Bad law or really bad law?

company cannot find this out before the bad guys uncover its secrets, the company's products and sometimes its very existence are at risk.

The same folks that brought you the DMCA are trying to improve it at the state level. Most parts of these laws are actually not as bad as the DMCA, although that wouldn't be all that hard. But there is some sloppy writing that could have a worse effect than the DMCA does, and that would be hard.

The Texas version of the bill says, in part: A person commits an offense if he or she intentionally manufactures or sells a communication device with an intent to "conceal from a communication service provider, or from any lawful authority, the existence or place of origin or destination of any communication."

Most of the bill is targeted at people who do things with an intent to defraud, but

this section, if enforced literally, could outlaw network address translators and common configurations in firewalls, both of which conceal the actual source and/or destination of a communication by rewriting the network addresses. As I've written before, I'm no fan of these devices used in this way, but outlawing them would be quite silly.

But the real problem with the way this section is written is that it could be read to outlaw secure VPNs. Such VPNs are what everybody should use if they are connecting back to a corporate network when they are on the road or at home. But because secure VPNs are actually encrypted tunnels, all of my communication — including the destination and source of any e-mail that I read or send through a VPN — is concealed from the local service provider and any lawful authority that might be listening.

I hope this is not what the bill actually is trying to control. If it were trying to outlaw encrypted communications between travelers and the companies that employ them, silly would not be the word to describe the idea. Maybe someone with a tiny bit of clue will fix this before any of these bills get approved. Note that I'm not implying that these state-level bills will actually help fix the problems that the copyright people have — the only things that will help here are some new business models. But at least let's not destroy American business to protect a few copyright holders.

Disclaimer: Harvard deals with bequests not behests, and the above is my own opinion.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Q A

Andreessen

continued from page 25

The difference is that now it's 500 million people doing this, with something like 3 trillion or so HTML pages.

It's the same dynamic as TV. TV was invented in 1950. Today, we have 500 channels instead of three. But it's the same model, exactly as it was 50 years ago. Once these things get started, it's hard to slow them down.

What about the idea of the semantic Web, new tags that will let applications and computers automatically interact?

The semantic Web [means you have to] retag everything that's out there [in HTML content]. Ummm, no. I don't think so. But if the browser isn't changing, the [original] architectural changes are still relevant.

How?

Before the browser, if a business had a software application, then that's what it would give to its employees, period. They never even conceived of exposing their applications to anyone else.

With the browser, all this changed. Amazon and eBay today have millions and millions of people using Amazon and eBay applications via the Web. Consumers log on to their PC and typically now are running applications on someone else's computer.

[So] you can get [Web] services, and transactions, and all this stuff. eBay has thousands of servers running very complex applications in a complex infrastructure to make this possible. But the users just see Web pages.

How will wireless technologies affect this model?

Wi-Fi [wireless LANs based on the IEEE 802.11 standard] will be the dominant form of the 'wireless Internet.'

Five years ago, my PC was linked to the Internet via a dial-up connection. I'd dial up my provider, log on, use my computer online for a while, then log off. That takes a lot of effort.

With Wi-Fi, on the other hand, as the way to access

DSL or cable modems, every computer is on the network all the time. Your usage pattern changes at once: you use your computer on the network intermittently, dozens of times a day. You're using it therefore more often in more day-to-day activities. Wi-Fi makes this all much easier.

What about the wireless Internet based on cellular data services?

Cell phone data is a complete market failure in the U.S. because the user experience is deeply inferior to what you do with a browser on the PC or even a handheld. Cell phone browsers based on [Wireless Application Protocol] just make you want to cry.

You're not a fan of converged devices?

There will be multiple devices [for each user], and wireless networking will enable that kind of diversity.

When I first went to a Kentucky Fried Chicken restaurant, they'd give you a spork — something that was half-spoon and half-fork. And I thought, 'why don't we have this at home?' And here's why: because what you actually want is to have a good fork and a good spoon. And the spork is neither.

The multipurpose device will always fail.

What's been Microsoft's contribution to the browser?

Undoubtedly, an overwhelming benefit has been the proliferation of the browser. Hundreds of millions of people now have access to it. Microsoft has been a very effective force. But it's also been a force in the eradication of the commercial [browser] market, and the elimination of any incentive to change the browser. It's not like they've changed a lot [in it].

What's hot in browser technology?

There's nothing emerging right now. Creativity stopped in 1997. Before that, there were huge numbers of changes: dynamic HTML, JavaScript, Java mail, plugins for security and other functions. And these were created by Netscape and many others.

What killed the creativity?

The browser market went away. There's no commercial incentive. It's all free. The browser today is basically what it was in 1998-99. The good news is that everyone

knows what a browser is and what it does.

What about the open source browser project, Mozilla?

Mozilla could affect this. It has lots of developers and a fair amount of users. But, again, there's no commercial incentive to create a competitor [to Microsoft's Internet Explorer].

At the beginning, you posted the beta version of Mosaic on an FTP server, not even a Web browser, because the Web in effect didn't exist at the time. How did the idea of graphic user interface [GUI] for the Internet arise?

We were at the University of Illinois, at the NCSA. Originally, the idea was to create supercomputers at a central site, and then let researchers log onto them from around the U.S.

But that model quickly didn't make any sense, because we all had these powerful Unix workstations on our desks. So the focus was shifting toward enabling the Internet as a medium for research and science. We were part of the software development effort to do that.

We needed to put a full GUI front end, as people had come to expect on the desktop. Originally, it was a renegade project with no [official] permission. It turned out people really liked it.

It was a free program, on the share-everything Internet. Why make it into a commercial product, by creating Netscape?

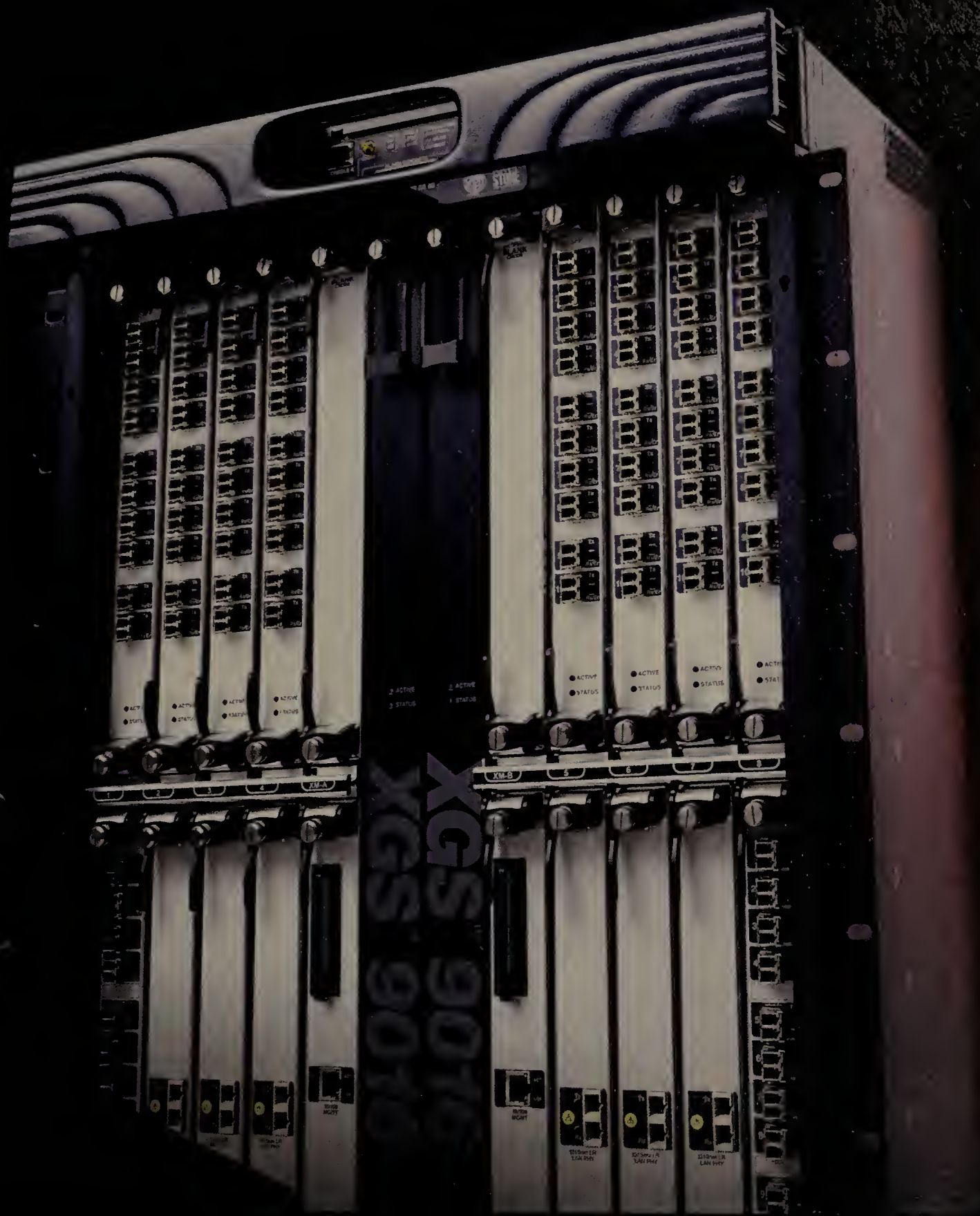
We took Mosaic as far as we could in a research environment. [There,] we could do new things without worrying about return-on-investment requirements. But you couldn't hire support people for the users. The National Science Foundation doesn't pay for technical support people.

So we decided to start Netscape around this idea.

In hindsight, would you change anything in the first release?

Probably not. Although there was one feature that was temporary in Mosaic: the Back and Forward buttons. That never made a lot of sense to us. Back to what? Forward to what? We thought there would be a better way to navigate. But no one ever came up with one.

When we started Netscape, we added stuff, such as a safe way to do secure transactions. The first Mosaic release was for Unix, and we quickly changed to Windows. At Netscape, Windows became our priority. ■

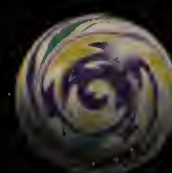


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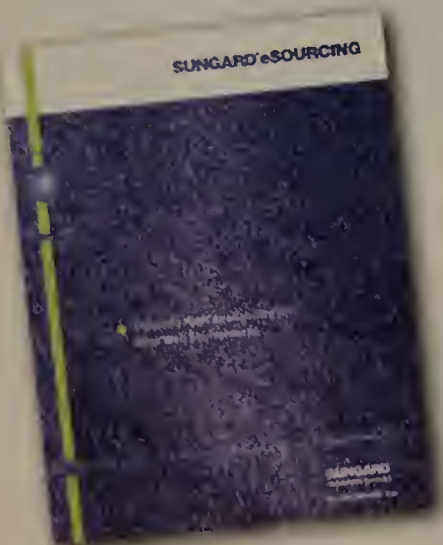


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Short Takes

■ **BellSouth** recently launched its first managed IP VPN service called **Managed Network VPN**. The service is available throughout BellSouth's service area in the Southeast.

The carrier's service is based on Multi-protocol Label Switching technology that BellSouth has deployed throughout its IP network. BellSouth is one of a handful of incumbent local exchange carriers that now are supporting IP VPN services including SBC and Verizon. BellSouth says it has signed up several customers to use the service including Lynk Systems. Lynk is using the Network VPN service to connect its fleet of point-of-sale terminals and automated teller machines. Price information for the service was unavailable.

■ The application service provider market continues to consolidate, with the latest **merger** between **BlueStar Solutions** and **Agilera**. BlueStar announced last week that it had signed an agreement to acquire Agilera, which is based in Englewood, Colo. BlueStar is an ASP that manages strictly SAP applications. With the acquisition, BlueStar will add Agilera's expertise in messaging and enterprise resource planning applications such as J.D. Edwards and Lawson into its mix. The combined company will be based in Cupertino, Calif., and will have more than 100 customers. Terms of the deal were not disclosed.

■ As expected, **Graham Wallace** is stepping down as CEO of **Cable & Wireless**, the company announced last week. The carrier is appointing **Francesco Galo** as its new CEO. C&W has also created the position of COO, which **Kevin Loosemore** will hold. In January, the carrier announced several executive shifts, which included the company's intention to replace Wallace. Before joining C&W, Galo was founder and CEO at European ISP Netscalibur and before that was CEO at Omnitel and Merloni.

AT&T offers new VoIP options

IP PBXs are supported for the first time.

■ BY DENISE PAPPALARDO

SAN JOSE — AT&T is expanding the reach of its voice-over-IP services by supporting additional vendor gear, including for the first time IP PBXs.

The carrier announced last week at the Spring 2003 Voice on the Net conference that it has certified IP telephony gear from Avaya and Cisco for its managed VoIP services. AT&T Labs tested Avaya's IP Telephony Solutions gear and Cisco's IP PBX and software to ensure interoperability with the carrier's network and VoIP services.

While support for Avaya's gear expands the choice of gateways and servers that customers can use, this is the first time

AT&T is supporting an IP PBX.

"Directly supporting an IP PBX platform is more efficient because voice calls do not need to be converted to packets; they originate as packets," says Joe Aibinder, director of AT&T voice over Internet services.

In the past, AT&T Managed VoIP customers were limited to using gateway devices and servers, such as Avaya's products, which convert TDM voice calls into packetized traffic for delivery over IP or frame relay networks.

Customers that use Cisco's IP PBX eliminate the TDM conversion because voice traffic is packetized from a user's desktop, Aibinder says.

"We've been hearing from big cus-



Managed VoIP

AT&T expands its VoIP services with support for additional customer premises gear including:

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- Avaya IP Telephony Media Server
- Avaya MultiVantage software
- Cisco IP PBX
- Cisco CallManager

SOURCE: AT&T

tomers ... that they want to know we can support [IP PBXs]. They're not demanding it now, but they want to know we can

See AT&T, page 31

Equinix offers multihoming service

Company uses peering points to more than 100 networks.

■ BY JENNIFER MEARS

FOSTER CITY, CALIF.— Organizations that multihome network connections from different service providers might get more than the high availability and optimal performance they seek from such arrangements: Managing multiple bills and setting up the routing necessary to use multiple ISPs can turn into a headache.

In answering that concern, Equinix is launching a service that it says simplifies the use of multihoming, which is the process of buying bandwidth from multiple providers and using the best performing link at any given moment. Equinix is taking advantage of its business model, which provides peering points for more than 100 networks, to give customers easier access to multiple ISPs.

David Passmore, research director at the Burton Group, says the service puts multihoming in reach of more companies.

"Typically, it's only the largest enterprises that can afford to do this and who have the skills to implement [Border Gateway Protocol]," he says. "Equinix makes it more of a turnkey implementation so that enterprises don't have to have a bunch of rocket scientists on staff who understand how to

set up BGP routing tables."

Instead, customers using the new service, called Equinix Direct, make one connection within the Equinix data center and then have access to multiple ISPs. They use a Web-based portal to choose service providers and direct how traffic is routed. Without the Equinix Direct service, customers would have to establish separate contracts with each ISP, says Jay Adelson, Equinix's founder and CTO.

Equinix uses patent-pending BGP devices called Equinix Direct Route Servers (EDRS) that talk to customer routers, telling them where to route traffic.

"Traffic doesn't go through the EDRS box. It listens to the EDRS box and determines where to go," Adelson says.

Adelson says that customers are not required to commit to bandwidth usage and that contract lengths are only 30 days. At the same time, customers get bandwidth at prices 30% to 60% lower than what they would get if they contracted directly with the ISPs, and only one bill to deal with, he says. They also have service-level agreements directly with participating ISPs.

Cost per megabit varies, and customers pay Equinix a port fee, which is \$250 per

month for 10/100M bit/sec connections and \$500 per month for a Gigabit port. The port fees are waived for the first six months, Equinix says.

Today, 15 service providers, including Level 3 and Yipes Communications, are participating in the service, which is available in Equinix's Washington, D.C., and San Jose data centers.

More service providers are expected to sign on and the service will be rolled out in other Equinix data centers according to customer demand, the company says. Equinix already has 10 customers for the service, including eBay/PayPal and Alloy.com. ■



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EYE ON THE CARRIERS

Johna Till Johnson



Carriers need to think 'integration'

I've spent the past few weeks in discussions with IT executives about their experiences with service providers.

The upshot is the IXC's are in trouble.

The big problem is a fundamental mismatch between what customers are asking for and what service providers sell.

What most IT executives want from their carriers can be summed up in one word: integration. "I'd like to be able to write one contract covering my global voice and data services, and have the carrier deliver to it," one executive says.

"Anytime, anywhere connectivity," says another.

What most service providers sell, however, is bandwidth — bandwidth that's packaged and managed and protected by a service-level agreement, sure — but still bandwidth.

The difference between integration and packaged bandwidth is the difference between fruit salad and whole fruit. Imagine going into a supermarket for fruit salad and being directed to row upon row of apples and pears, each buffed to a sheen and lovingly wrapped in tissue paper — but not chopped, mixed and packaged in an airtight plastic container, ready to serve to the 12 dinner-party guests that will sit down at your table in half an hour. See the difference?

It's starting to get critical because for the first time, IT shops at midsize to large companies are starting to talk seriously about turning away from the WAN services IXC's offer and implementing Internet-based VPNs as their primary WANs. (Internet-based VPNs rely on encryption technology across the Internet, as distinct from network-based VPNs based on services from a single carrier using technologies such as Multi-protocol Label Switching.)

Says one executive: "After extensive traffic

analysis, I realized that the majority of the traffic on my WAN is external. So why should I pay the extra money to transport this traffic over my internal WAN?"

This executive is seriously considering an Internet-based VPN, and he's not alone. By my informal estimate, a majority of small to midsize organizations are relying on Internet-based VPNs for their services. As the bigger companies begin to go this route, service providers can expect margin compression and decreasing revenue for business services such as frame relay and ATM.

Now setting up and configuring an Internet-based VPN is primarily an integration exercise. You're buying fruit salad instead of fruit.

At first blush, this might not look like such a problem for the IXC's because they're also the major Internet providers: The revenue ends up in their pockets either way. But that misses the point. The real effect is on service provider business models.

If you believe what you're selling is bandwidth, your entire sales and operations divisions are optimized around selling, managing and monitoring that bandwidth. If you're selling integration, you focus your time, effort and resources on making that integration as seamless as possible. You start to look more like the new IBM (selling primarily services) instead of the old IBM (selling primarily hardware and software).

Not many IXC's have made the leap. And until they do, they'll continue to struggle ... or end up like IBM's erstwhile competitor, DEC, which never did figure it out.

Johnson is president and chief research officer at Nemertes Research, an independent technology research firm. She can be reached at johna@nemertes.com

AT&T

continued from page 29

do it," he says.

Although the Cisco IP PBX setup lets customers use IP phones on their desktops, the system is still limited to H.323 support. Aibinder says AT&T uses Session Initiation Protocol (SIP) signaling at the core of its network, but now products are limited to the H.323 protocol.

SIP is considered by many to be the preferable technology because it more quickly and efficiently sets up and tears down calls. WorldCom has supported SIP gear since it rolled out its first VoIP services more than two years ago.

While the core of AT&T's network is based on SIP, Aibinder says AT&T is not

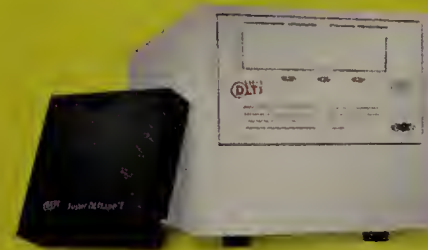
married to any one standard and all services will be "backward compatible." Although AT&T plans to offer support for SIP-enabled customer premises gear, it will continue to support its H.323 customers in the long term, he says.

"There are real benefits with SIP," says Vijay Bhagavath, analyst at Forrester Research. "It's one-tenth as complex as H.323."

AT&T is committed to supporting SIP so they are moving in the right direction, but they should have gotten there sooner, he says. "WorldCom has leap-frogged AT&T in terms of its SIP based services and (AT&T) has to treat them as a significant competitor. They cannot ignore (WorldCom) by saying it's in financial trouble."

AT&T declined to reveal pricing. ■

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■ SERVICE PROVIDER DEVELOPMENTS
AT THE JUNCTURE BETWEEN THE ENTERPRISE
AND THE NEW PUBLIC NETWORK

Riverstone lowers entry bar for 10G

Sub-\$10K per-port cost intended to create demand, spur adoption.

■ BY JIM DUFFY

SANTA CLARA — Riverstone Networks this week will enter the 10G bit/sec Ethernet market with switches designed to

establish a new entry price.

Riverstone's XGS line of 10G Ethernet switches are priced at just less than \$10,000 per port — one-third the cost of competing products and below the average cost of 10 1G bit/sec Ethernet ports, the company says. By pricing the switches at this level, the company hopes to dismantle a significant barrier to 10G Ethernet adoption while creating demand for its products in a frugal market that does not yet require 10G Ethernet capacity, analysts say.

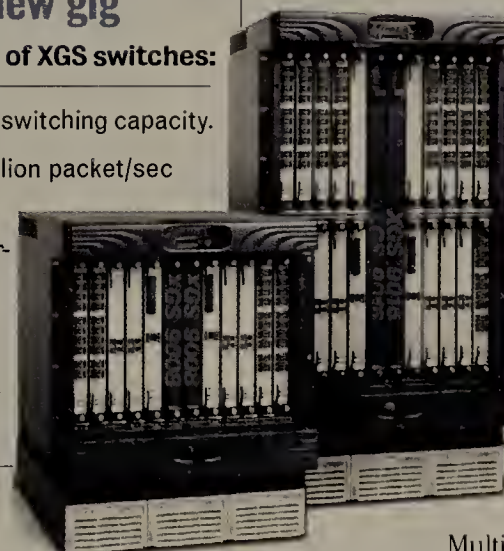
"I don't think we need 10G at this point; what would you do with it?" asks Michael Kennedy, principal and co-founder of Network Strategy Partners.

Kennedy says it could be used to aggregate 1G bit/sec metropolitan Ethernet services once service providers roll out those offerings.

Riverstone's new gig

Features, functions of XGS switches:

- 160G to 640G bit/sec switching capacity.
- 200 million to 800 million packet/sec forwarding.
- Half-rack and quarter-rack configurations.
- Redundant fabric and CPU, "hitless" failover and modular code base.



"But that rollout is very evolutionary so there's probably not a lot of demand for 10G bit/sec capacity," he says. Riverstone's XGS line consists of two switches: the XGS 9016 and the XGS 9008. The 9016 is a half-rack, 16-slot chassis with

320G bit/sec of switching capacity and 400M packet/sec of throughput that's upgradeable to 640G bit/sec and 800M packet/sec with a second fabric.

The 9008 is a quarter-rack, eight-slot system with 160G bit/sec of capacity and 200M packet/sec of throughput, upgradeable to 320G bit/sec and 400M packet/sec with that second fabric. Both switches feature Riverstone's Hitless Protection System software for resiliency and

Multi-protocol Label Switching for traffic engineering, company officials say. Knology, a service provider in the Southeast, is beta-testing the XGS systems for deployment in a video-on-demand service infrastructure.

See Riverstone, page 35

Internet Photonics unleashes GSLAM

Aggregation system designed for cable operator headends and service providers' POPs.

■ BY JIM DUFFY

MARLBOROUGH, MASS. — Internet Photonics, a developer of optical Ethernet and 10G bit/sec metropolitan transport systems, last week announced a high-end aggregation and switching system.

The company's LightStack Gigabit Services Line Access Multiplexer (GSLAM) is designed to aggregate, switch and multiplex services, including managed services, over any fiber facility without disrupting existing traffic. The system integrates optical transport, access service aggregation, switching and add/drop multiplexing functions in one device, and can support 64 Gigabit Ethernet connections per chassis and 256 per fiber for cable headend and service provider point-of-presence applications.

The LightStack GSLAM is a nine rack-unit chassis with eight service module slots. The platform's fabric allows aggregation and switching of any port to any port, Internet Photonics says.

Two service modules are available: an eight-port Gigabit Ethernet module and a

single-port 10G bit/sec dense wavelength division multiplexing (DWDM) trunk module. The eight Gigabit Ethernet connections, each with its own "circuit-like" subchannel for low latency and jitter, are multiplexed onto one 10G bit/sec DWDM wavelength.

The LightStack GSLAM also features Internet Photonics' SONET WrapAround technology, which inserts optical Ethernet services onto the same fiber as SONET/synchronous digital hierarchy (SDH) service traffic using different wavelengths and without disrupting existing traffic. The system also can provide network fault detection and protection switching within 50 microsec, Internet Photonics says, which is 1,000 times faster than SONET/SDH's 50-millisecond recovery.

The LightStack GSLAM can be used with Internet Photonics' existing LightStack MX and MXA transport and access platforms deployed in remote hub sites or premises. The system already is deployed in a large cable operator network and is in trials with another operator. Currently, it also is undergoing the Telcordia Operations Systems

Modifications for the Integration of Network Services Process, a prerequisite for sales to incumbent local exchange carriers and regional Bell operating companies.

Separately, Internet Photonics announced that Cablevision is deploying more than 200 of the company's optical Ethernet and WDM transport platforms in its video-on-demand network. The operator has completed deployment in eastern Long Island, in New Jersey and in the New York-Connecticut area for service that will reach 3 million homes, Internet Photonics says. ■



More online!

Read more details about
the Internet Photonics architecture.

DocFinder: 5030

Takes

■ **Tellabs** recently announced that it is expanding its OEM relationship with **White Rock Networks** by investing in the company. Under the arrangement, Tellabs will market and sell a customized version of White Rock's **VLX2020** next-generation SONET add/drop multiplexer, which supports interfaces ranging from DS-1 to OC-192, and Ethernet. Tellabs also now will offer a customized version of White Rock's **VLX1010**, a wavelength division multiplexing platform that supports a migration from coarse WDM to dense WDM for customers requiring greater capacity. The companies also are working to develop interoperability between the customized White Rock products and Tellabs' 6400 transport switch, 6500 transport switch and 5500 digital cross-connect. They also are jointly pursuing Operations Systems Modifications for the Integration of Network Elements certification and a combined management system product. To underscore the expanded relationship, **Rob Pullen**, Tellabs' senior vice president of North American sales, will serve on White Rock's board of directors.

■ **WaveSmith Networks** last week extended its DN multiservice edge switches with Multi-protocol Label Switching capabilities and unveiled three additions to the line: the **DN 8100** multiservice switch; the **Multi-service Forwarding Module** for all DN switches; and MPLS software that runs on the MSFM and on the existing packet forwarding module. Pricing for the new products was not disclosed. They are expected to be available in the fourth quarter.

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Translation:
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Tests by Dell on Oracle 9i on a global database. Dell configurations: Dell PowerEdge 6650 server with four 2.0 GHz Xeon MP processors, Red Hat Linux Advanced Server 2.1, 3 Year Gold Support. Price: \$32,701 (www.dell.com, 1/20/03) and Dell PowerEdge 2650 server with two 2.8 GHz Xeon DP processors, Microsoft Windows 2000 Server, 3 Year Gold Support. Price: \$9,324 (www.dell.com, 2/10/03). Sun configuration: Sun Fire V480 server with four 900 MHz UltraSPARC III processors, Solaris 9 (12/02 version). Price: \$53,796 (www.sun.com, 3/17/03), 3 Year Gold Support. For details and more see www.dell.com/migration12.

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Apptix raises autoprovisioning platform

■ BY JENNIFER MEARS

STERLING, VA. — Apptix, a spinoff of application service provider TeleComputing, last week unveiled upgrades to its automated provisioning platform to make it easier for service providers to offer applications on demand.

The updates to Apptix's Tecos 4.0 platform include tighter integration with Microsoft .Net, which is designed to make it easier to add Microsoft applications to the provisioning framework. The upgrades also include centralized management for a wider range of implementations so service providers can deliver applications not only from a shared infrastructure, but also from dedicated servers and customer premises installments.

Tecos is the platform that ASP TeleComputing uses to deliver software as a service. Last year, TeleComputing, which was founded in 1997 in Oslo, Norway, and still operates as an ASP in Europe, spun off Apptix in the U.S. so it could focus on letting service providers become ASPs. Since then, Apptix has struck up partnerships with Microsoft and HP, and its customers include Digex and XO Communications.

With Tecos, Apptix offers an operations-support system platform that service providers can use to manage billing and other business processes associated with the delivery of hosted applications. Applications are delivered through portals that the service provider brands. Tecos lets service providers roll out a hosted application in as little as 30 days and avoid the high upfront costs they would incur if they had to build a provisioning platform themselves, Apptix executives say.

Tecos 4.0 gives service providers more flexibility in how they manage and deliver applications because of its tighter integration with Microsoft provisioning and Web services, says Alex Hawkinson, Apptix CEO. A service provider can manage a dedicated deployment and a shared deployment

from one management interface, he says. And because Tecos 4.0 is fully integrated with the Microsoft Provisioning System, service providers more easily can customize how applications are delivered.

That's a big reason why Digex chose Apptix to provide the framework for delivering its hosted Microsoft Exchange service.

Serving software
In 2002, customers spent more than
\$2.3 billion
on software as a service. IDC expects the market to reach
\$8 billion
in 2007.

"We liked the strength of their platform, how it's tied into Microsoft .Net and how we can customize that platform and then create our own messaging solution," says Bobby Patrick, chief marketing officer for Digex. "Tecos 4.0 allows us to further customize our unique offering on top of their software."

Digex is using Tecos to deliver the hosted Exchange service it rolled out earlier this year. It plans to begin using the Tecos 4.0 platform by the end of the summer.

"There will be new service levels that are more customized around unique business needs vs. today the service levels are, 'Do you want the wireless options or not?'" Patrick says. "[With Tecos 4.0] we'll be able to talk about how we can tie messaging into our customers' businesses better."

Amy Levy, a senior analyst with Summit Strategies, says Apptix is giving service providers what they need to be success-

ful delivering software as a service.

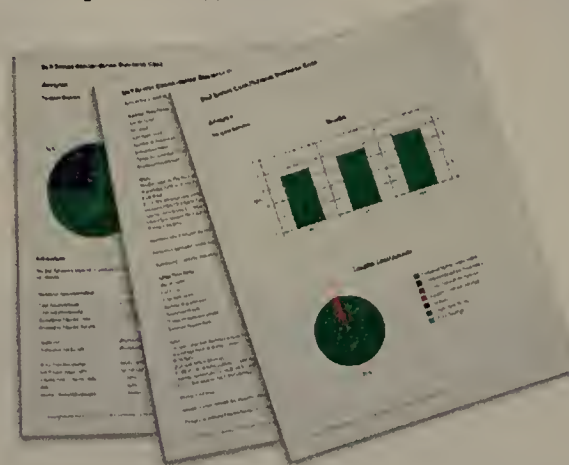
"The big improvement [in Tecos 4.0] is flexibility in terms of the types of cus-

tomers that service providers can support and the types of applications they can support," she says. ■

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Riverstone

continued from page 33

"We're looking at the ability to aggregate high-speed data customers and [video-on-demand] applications over a large pipe," says Bradley Frye, data services manager at Knology. "What we saw, we liked."

However, Riverstone's XGS switches are

missing some features Knology needs, such as access control lists and specific ways to configure Layer 3 interfaces with Riverstone's SmartTrunk link aggregation applications, Frye says.

But Riverstone and other 10G Ethernet suppliers might be facing more daunting challenges, even at \$10,000 per port.

"Will actual buyers see the need for this, or will they basically just continue to buy 1G bit/sec and wait and see on the 10G bit/sec?" Network Strategy Partners' Kennedy asks.

The 9016 costs \$33,000, while the 9008 costs \$19,980. Both will be available in June. ■



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Technology Update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

WebDAV secures collaboration

■ BY LISA DUSSEAUT

Web-based Distributed Authoring and Versioning is an extension of HTTP that lets users collaborate via the Internet. The Internet Engineering Task Force approved it as a standards-track specification in 1998, and it has been deployed widely on multiple platforms and in applications from many vendors.

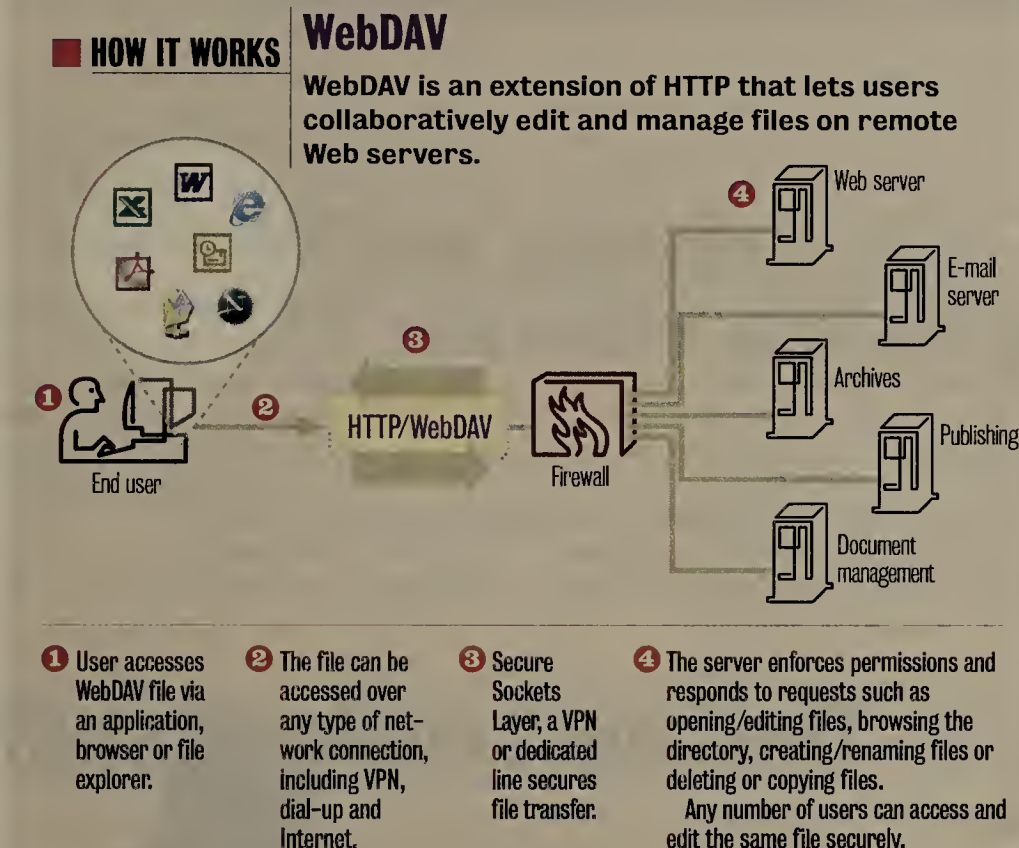
WebDAV can be found in Web servers such as Apache and Microsoft Internet Information Server and now is also supported by leading document and content management vendors. WebDAV functionality also is embedded in common desktop operating systems, including Windows and Mac OS X, and popular applications from Adobe, Lotus, Microsoft and others.

So why all the support for this lesser-known sibling of HTTP? The protocol adds new features that let users access and edit files via the Internet. Simply put, this allows for easy and secure collaboration from any Internet location.

A user editing a document stored on a WebDAV server can lock the file and protect it from anyone overwriting those changes. WebDAV version control also makes it possible for users to know which version of a file is the most current, minimizing confusion.

WebDAV access-control lists provide advanced control over read, write and sharing permissions for every file, further improving system security. Analysts recently have suggested that the file management features in WebDAV can make it a cost-effective alternative to traditional document management products.

WebDAV imposes a common data model that includes collections, resources,



locks and properties, and defines a common syntax using HTTP messages with custom methods, headers and bodies.

Extending HTTP, WebDAV defines several methods for file management, such as Copy and Move, and Mkdir for creating new Web folders.

The Lock and Unlock methods let a document be protected while the author makes changes. The Propfind and Proppatch methods let folders be browsed and offer flexible management of meta-data. All these methods operate on HTTP

resources, so any Web server that supports WebDAV provides an integrated system for secure authoring.

Consider a few scenarios that WebDAV was built to address:

- A sales team working from remote offices or while traveling needs to access information about their company's latest product release. This information (price sheets, screenshots and Flash demos) is stored in a common location on the company's WebDAV-compatible server. Although the sales team members use differ-

ent applications and network access methods, they can each use HTTP and WebDAV to view and customize the sales materials for their own purposes, often without leaving their standard desktop applications.

- A hospital needs to ensure that patient information exchanged between doctors and technicians is more secure. They realize that e-mail attachments no longer meet compliance requirements and attachments are becoming too large to share easily. They choose a WebDAV-compatible server to manage their patient files so participants can exchange secure links to the files, instead of file attachments. All file access can be authenticated against the hospital's Lightweight Directory Access Protocol server, and all file transmissions are encrypted in Secure Sockets Layer, improving system compliance.

Most users can identify with the frustrations of not being able to access information when they've needed it or trying to collaborate via e-mail. FTP could help address these issues, but most users find it too complex, and it doesn't provide the security benefits of WebDAV that many IT managers have grown to appreciate.

So, where is WebDAV headed? It's quite possible that WebDAV will remain almost invisible to most users as it becomes part of everyday applications. The protocol is fulfilling its promise of extending current file systems beyond the LAN to include just about any user or resource on the Internet.

Dusseault is director of server development at Xyθος Software and the co-chair of the WebDAV Working Group at the Internet Engineering Task Force. She can be reached at ldusseault@xythos.com.

Ask Dr. Internet

By Steve Blass

We downloaded a Windows network sniffer program as suggested in your Aug. 28, 2000, column (www.nwfusion.com, DocFinder: 5029) to troubleshoot a network slowdown. Now what? We see the results, but without some idea of what we're looking for it's like reading a foreign language.

After selecting the default network adapter from the setup menu, go to the Captures menu and choose Begin. Click the Start button in the pop-up

dialog. Let the capture continue until you observe the network symptoms you are troubleshooting, then click the Stop button. The program displays a spreadsheet with columns for destination and source media access control addresses, IP addresses, and a summary identifying TCP/User Datagram Protocol (UDP) port numbers and protocol information. Click the IP address column labeled Network to sort the data by IP connection. Look for the IP addresses of the machines giving

you trouble. Scan through the summaries, looking for sudden changes such as unanswered or repeated requests that coincide with the communications slowdown. Experiment with the Advanced Filter settings in the startup dialog to narrow the search for subsequent captures.

Blass is a network architect at Change@Work in Houston. He can be reached at drinternet@changeatwork.com.

GEARHEAD INSIDE THE NETWORK MACHINE

Mark
Gibbs



Windows registry magic

So is life better? Arguably it is because you can back up the registry and be pretty certain that most of your key settings are safe. On the other hand, the registry is fragile, and if it should get damaged you could be in for a miserable time. Your system might not start, only partially start or be unstable in one of those "I know something is wrong with this computer but I'm damned if I know what it is" kind of ways. Such is the magic of Windows.

Microsoft has turned the registry into a mysterious object that it says is best left to uber-geeks. But let's get real: Messing with the registry is as dangerous as messing with the file system. Just treat it with the respect it deserves. Anyway, let's talk about how the registry is organized, and in doing so we'll focus on Windows XP and 2000.

At its heart, the Windows registry is a hierarchical database. Under the root of registry hierarchy — called My Computer — are root keys that are like subdirectories and they can contain subkeys (sub-subdirectories) and values. Subkeys also can contain further subkeys and values. Finally, values have names (any characters other than "\", "*", or "?"), types (which we'll get to in a second) and data.

You will note that all root key names start with HKEY. There is an extremely geeky reason for this: The root key names

are Win32 (that's Windows 32-bit) handles (that's the "H" part) to keys ("KEY").

Root key is an understandable concept but these entities also are called root handles, which is reasonable because they are, indeed, handles. But they also are called hives, which is not reasonable and merely adds gratuitous obfuscation for no apparent reason. Such is the magic of Microsoft development.

The root keys divide the registry data into categories — note that you can't add new root keys or delete existing ones. Here are the root keys:

- HKEY_CURRENT_USER: data associated with the currently logged-on user.
- HKEY_USERS: information about all the accounts on the machine.
- HKEY_CLASSES_ROOT: file association and Object Linking and Embedding registration information.
- HKEY_LOCAL_MACHINE: system-related information.
- HKEY_CURRENT_CONFIG: information about the current hardware profile.

The values stored under keys are either the default, "value not set," or one of the following data types (note that only the first five values were used in Windows versions before Windows 2000):

- REG_BINARY: binary data.
- REG_SZ: a fixed-length string.

- REG_DWORD: a 4-byte (DWORD) value.
- REG_MULTI_SZ: multiple REG_SZ strings.

- REG_EXPAND_SZ: an expandable string.

- REG_DWORD_LITTLE_ENDIAN: same as REG_DWORD.

- REG_DWORD_BIG_ENDIAN: a 32-bit number with the most significant byte is the rightmost, or low-order, byte. (Opposite of the order of REG_DWORD and REG_DWORD_LITTLE_ENDIAN.)

- REG_LINK: a symbolic link between system or application data and a registry value.

- REG_FULL_RESOURCE_DESCRIPTOR: nested arrays designed to store a resource list for a hardware component or driver.

- REG_RESOURCE_LIST: a group of REG_FULL_RESOURCE_DESCRIPTOR values for device configuration.

- REG_RESOURCE_REQUIREMENTS_DESCRIPTOR: binary list of required resources for a device.

There also are unused data types such as REG_NONE (a value with no data) and a series that starts REG_Q instead of REG_D for 64-bit values for some future 64-bit version of Windows.

Fair makes your head spin doesn't it?

Cries of "mercy!" to gearhead@gibbs.com.



Cool Tools

Quick takes
on high-tech toys
By Keith Shaw

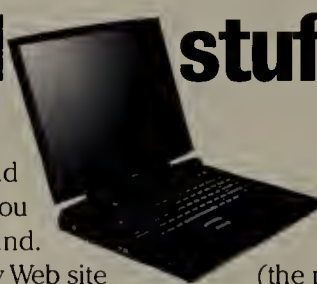
After some time off and traveling to trade shows, we've acquired a backlog in the Cool Tools Testing Labs (also known as my cube). Here's a roundup of new products that win the Cool Tools Seal of Approval:

Skullcandy's Link

This cool company has created an awesome set of headphones (street style, behind-the-head) that takes the cord and splits it, so that you can connect to an audio player (digital or otherwise) and a cell phone at the same time. A combination volume control/ microphone clips onto your shirt. If a call comes in when you're listening to music, you can press a button on the cord to answer the phone. The

Skullcandy's Link lets you connect to phone and audio player at same time.

The latest cool stuff from our labs



The Satellite Pro comes with 802.11a, 802.11b and integrated wireless capabilities.

While the notebook was heavy to carry on trips (the price to pay for having the integrated DVD drive to watch movies), this was a good notebook to have as a portable desktop replacement. Integrated wireless capabilities meant not having to lug around another PC card (no matter how light, it's still extra equipment), and we were able to quickly scan and connect to wireless networks.

ZyXEL ZyAIR wireless

We get a lot of small office/home office wireless LAN equipment, and I was expecting another somewhat difficult installation when I tested the ZyAIR 802.11b wireless LAN equipment from ZyXEL. I was pleasantly surprised when the installation at a colleague's home was easy, despite installing it on different machines with different operating systems (including Windows 98).

We were able to easily install the ZyAIR-B-2000 four-port router (\$160), which let us connect an Ethernet-enabled desktop to the gateway, while providing wireless access to a second desktop upstairs, and to a notebook. We took the second desktop and connected it to the network via the ZyAIR B-200 (\$70), a USB-enabled network adapter. Our notebook connected to the wireless network via the ZyAIR B-100 PC Card (\$70). It's good to see vendors taking an active interest in home users, especially with set-up software getting easier to use.

The ZyXEL gear also had some advanced security features, including support for 802.1x authentication. Companies that want their teleworkers to have secure equipment that's still easy to use should consider ZyXEL.

Shaw can be reached at kshaw@nww.com.

music continues to play in the background (only you can hear it, not the caller), and you can use the volume control to lower the sound. It's a great value at \$30. Go to the Skullcandy Web site (www.skullcandy.com) to order.

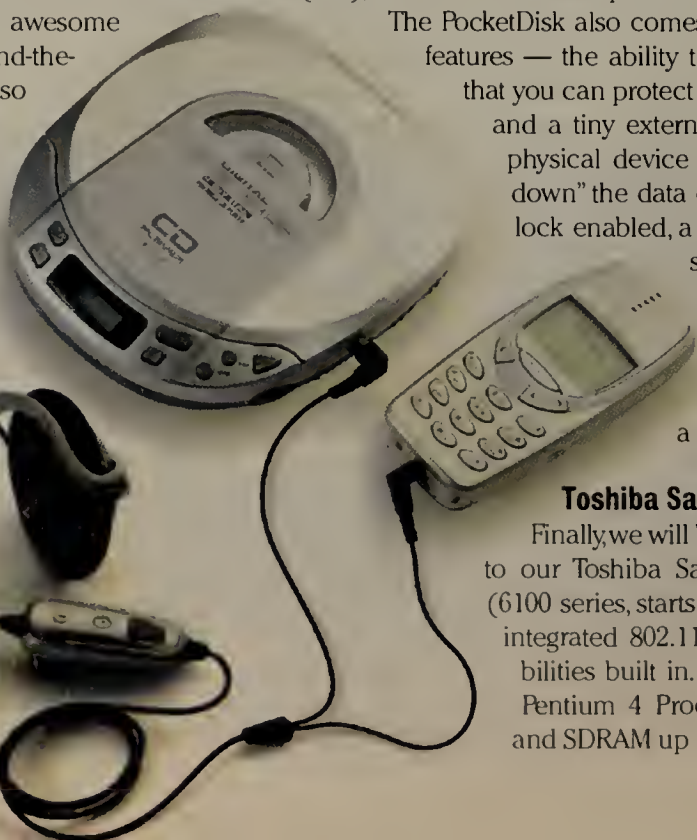
Ioplus PocketDisk

We've seen lots of USB-based flash memory personal storage devices, but check this one out. The PocketDisk comes in sizes ranging from the \$23 16M-byte version up to the \$290 512M-byte version. We received the 128M-byte version (\$60), and found it a nice replacement for the floppy disk.

The PocketDisk also comes with two interesting features — the ability to add a password so that you can protect the data on the drive, and a tiny external "slide lock" on the physical device that lets a user "lock down" the data on the drive. With the lock enabled, a user can't erase data stored on the device. It reminded me of the hard plastic locking mechanism you once found on a 3.5-inch floppy disk.

Toshiba Satellite Pro notebook

Finally, we will be sad to say goodbye to our Toshiba Satellite Pro notebook (6100 series, starts at \$1,458) with dual, integrated 802.11a and 802.11b capabilities built in. It had a Mobile Intel Pentium 4 Processor with 2.0 GHz, and SDRAM up to 1G byte.



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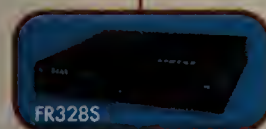
Broadband Firewall/VPN



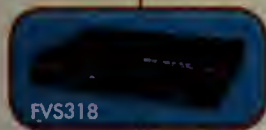
4-Port Firewall
w/Print Server



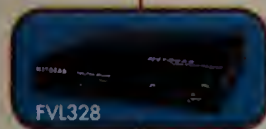
802.11b Wireless Firewall
w/Print Server



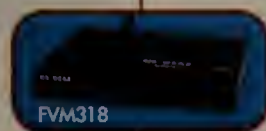
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EDITORIAL

John Dix

IP PBX debate brings on fireworks

The back and forth at the Network World IP PBX Showdown at the Voice on the Network conference in San Jose last week was, in a word, spirited.

The goal of the presidential-style debate — hosted by yours truly and Mike Hommer, manager of consulting for Miercom — featured speakers from Alcatel, Avaya, Cisco, Mitel and Nortel. Here are some outtakes:

- Tony Pereira, director of enterprise solutions marketing at Nortel, asked Bill King, Cisco technical marketing manager, how Cisco can keep up given “we’re building to the future and you’re trying to catch up to stuff we already have.” King said there are some features Cisco will never add, like support for rotary phones, but admitted there is a shortfall and “we are addressing the feature gap. We’re investing heavily. Our R&D spending is as high as Avaya’s total revenue.”

- Avaya encrypts packets at the phone, making for a secure environment, so we asked Alcatel about its security story. Jeanne Bayerl, director of product marketing, said the real issue is availability, keeping your call controller from getting hacked. Alcatel, she said, has that licked.

- Cisco’s King asked why a lot of Avaya bids are TDM with a little IP thrown in, even in greenfield installations. Avaya’s Mack Leathurby, director of converged system and unified communication applications, came back: “Customers typically have lots of legacy gear in other offices, and this hybrid approach is the easiest way to support it.”

- Avaya’s Leathurby to Nortel: You sold off your CRM company so how do you address questions about customer contact centers? Pereira: “Our contact solution is as good as yours, probably a little better. Our professional services organization will work with customer and third-party vendors to address any and all needs.”

- Mitel’s Christian Szpilfogel, director of product line management, accused Cisco of not playing fair: “You own the Layer 2 and 3 switch market, and we want to make sure our systems work in that environment, but you won’t give up things like the Cisco Discovery Protocol. We have to reverse engineer that to use inline power in Cisco environments. Why?” King said, a little sheepishly, “it isn’t public because it is one of the things that we use to add value.”

And so it went. At the end a person in the audience asked when IP would bypass TDM in terms of line shipments. Alcatel was most optimistic, saying this year, Cisco, Mitel and Nortel put it at 2005, and Avaya at 2008. That’s quite a range.

— John Dix
Editor in Chief
jdix@nww.com

DSL prioritization

In the story “DSL penetrates the business market ... slowly” (www.nwfusion.com, DocFinder: 5024), I’m confused by For Eyes Optical IT manager Shuib Khan’s statement that asymmetrical DSL (ADSL) speeds vary depending on how many users are on the DSL network as compared with other DSL technologies.

If he meant that more users on a customer’s LAN would cause the customer’s individual service to slow down, that would be true of any Internet access. Perhaps he meant ADSL was more prone than other DSL technologies to slow down as more users adopt the ISP’s network. I would say that would be true of any ISP’s network and has to do with how an ISP manages traffic load and network build-outs to compensate for load. To my knowledge, all DSL technologies connect to an ATM backbone and carry similar low-level quality of service for their connections. So all DSL is typically going to suffer from that sort of prioritization in the provider’s backbone.

Gordon Coogan
Anaheim, Calif.

Migrating to Linux

Regarding Mark Gibbs’ Backspin column “Why aren’t you migrating to Linux?” (DocFinder: 5025): It took me 10 years to be able to handle any curve ball in the Windows server/desktop environment. That’s a lot of practice — on my own and from mentors. Not everyone is in a cutting-edge department. I am the lone IT guy in a small manufacturing business. Now I have to learn Unix on my own — not a pleasant thought. Implementing and replacing working systems with Linux — that’s where the fear comes from.

E-mail letters to jdix@nww.com or send them to John Dix, Editor In Chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

opinions!

There will come a (price) point where the savings outweigh the fear, but it isn’t here. That will come when Microsoft and other application providers no longer support Windows NT 4.0. When I can’t support the legacy environment, I will venture out.

Dave Kaplan
Vice president, IT
International Patterns
Bay Shore, N.Y.

I’ve been using Linux as my desktop operating system for a few years. I originally did it with the goal of getting more familiar with Linux because our Web server is a Red Hat box. But I soon found I preferred Linux over Windows for many reasons. If you run Windows and Red Hat on the same box, you’ll find the Red Hat system — even with a graphical user interface (GUI) environment like Gnome — is noticeably more responsive. I also have significantly more control over my environment, can work easily in GUI or command-line mode (whichever better suits a given task), and don’t have to worry about e-mails containing macro viruses and such.

There is a downside, though. OpenOffice and Mozilla are great applications, and the typical user could probably run a Linux desktop without feeling much pain. But I miss some commercial apps. Even though I’ve always coded pages by hand, it would be nice if Dreamweaver (or an equivalent) would run on Linux; and while Gimp is good, it really isn’t a Photoshop replacement. So this Linux “switcher” is probably going to make another switch soon — to Mac. In my view, Mac OS X should have all the advantages of my current Linux system, and will give me the flexibility to run the commercial applications I want. Time will tell.

Travis Saling
Webmaster
Department of Electrical Engineering
University of Washington
Seattle



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SECURITY CHECK

Robert Gezelter

On Sept. 11, 2001, many New York businesses disappeared from the Internet because their DNS services were fragile. Fragility is the opposite of resilience, the ability to continue operations despite damage to individual elements.

User-reported difficulties indicate insufficient resilience. The first reports of infrastructure problems should come from internal monitoring systems, not a flurry of phone calls from users.

DNS translates domain names into IP addresses. The most publicized concerns with DNS involve root name servers, which are beyond the control of typical Internet users. Less publicized are issues involving the organization and provisioning of the name servers for enterprise domains, which are within a company's control and often are neglected.

A misconception is that a company's ISP is responsible for providing servers to answer queries for the company's domains. While most ISPs provide DNS services for their customers, the details vary greatly. Some ISPs will act as authoritative secondary name servers, downloading the actual DNS zones from user-maintained DNS servers; some will not. Beware: DNS failure is e-commerce death.

In the end, DNS resilience is determined by the steps a company takes to ensure that its domain data remains available to the Internet.

The most rudimentary step to ensure resilience of your Internet presence is to always have, at a minimum, primary and secondary DNS servers for the domain. These servers should be distinct systems in different locations.

Single points of failure must be avoided. Achieving geographic dis-

The need for DNS resiliency

person is neither difficult nor expensive. Resorting to a hosting service or ISP is often unnecessary, although it is an option. A field office or sister organization easily can provide the few cubic feet and kilobytes per hour (yes, per hour) required to house an alternate DNS server. The system even can be managed remotely.

A production site with many concurrent users justifies extensive monitoring. Each link in the chain connecting customers to the site should be monitored on a basis sufficient to alert the organization to problems in a timely manner. With DNS servers, regular verification that the name servers are online and responding properly is prudent.

Diversity of carriers, geographic location and routing are important steps to ensure that single-source errors do not disrupt your DNS services and impair your Internet presence.

In a piece of fabric, an individual thread or moderate number of threads may break without compromising the function of the whole. Analogously, failures that do not result in service disruption will never lead to customer dissatisfaction. Dispersion of functionality is far less expensive and far more resilient than attempts to harden facilities beyond the possibility of damage.

(This column is a condensed version of a newsletter that appears on Network World Fusion at www.nwfusion.com, DocFinder: 5026.)

Gezelter is a network security consultant and a contributor to The Computer Security Handbook, 4th Edition. He can be reached at gezelter@rlgsc.com.

DNS resilience is determined by the steps a company takes to ensure that its domain data remains available to the Internet.



INDUSTRY COMMENTARY

Frank Dzubeck

My last column on technological discontinuities in 2003 (www.nwfusion.com, DocFinder: 5027) generated significant reader e-mail regarding the feasibility of voice becoming the "killer" application for IEEE 802.11 (Wi-Fi). In the past few months, global capital commitments and

scheduled deployment into public areas such as hotels, airports, cafés, stadiums and truck stops have fueled Wi-Fi growth. This aggressive roll-out counters the notion that it will be impossible for Wi-Fi to achieve the ubiquity of cellular wireless. In all probability, cellular mobility will coexist with and complement public and private Wi-Fi deployment until the IEEE solves the distance limitation problems.

Wi-Fi's strength — and cellular wireless's weakness — is data. Cellular wireless deployment for data has been hampered by cost and throughput issues that equate to high usage charges. Data will not be the increased call-minute panacea that carriers hoped would pay for licenses and upgrades to 3G and other cellular technologies.

To make an analogy to the wireline world, at one time the PBX was considered a data switch with connection speeds of 1.2K to 9.6K bit/sec. The IEEE 802.3 LAN arrived to compete with the PBX and delivered increasingly higher data rates to users. As the technology matured, IEEE 802.3p/q added quality of service to the LAN and let low-bit-rate real-time voice use the "Ethernet highway." Today, the PBX and LAN coexist, but the PBX faces inevitable retirement. Similarly, in the WAN, data traffic has surpassed voice traffic in carrier networks. Class 5 networks designed to support voice and disastrously redesigned to support data using ISDN are now passé. Coexistence is still the case, but voice over IP will be the eventual victor. The data highway always will be the winner when compared with the voice highway.

Technological history has a way of repeating itself. What occurred in the wireline arena will replicate itself in the wireless arena. Wireless technologies such as cellular, IEEE 802.11, IEEE 802.15 and IEEE 802.16 will coexist for a time. Cellular was designed for voice, the other three for data. How long they coexist will be, as in the wireline space, an eco-

nomic, rather than a technological, issue.

One reader commented on the limitations of Wi-Fi with respect to the number of users that can be serviced per base-station access points and the allocation of finite resources per user. At least four approaches have emerged to address this problem. The first uses high-capacity, longer-range Wi-Fi switch/access points to transmit narrow beams of packets only to designated wireless devices. The second uses distributed dumb Wi-Fi access points and a new generation of intelligent Ethernet switch that centrally aggregates and controls multiple access points. The third creates a multiple smart-antenna access point that can aggregate hundreds or thousands of users. The fourth uses an intelligent base-station switch to aggregate and control distributed smart antennas. My bet is that the second approach will win out because of cost, ease of implementation and management.

Many readers discussed security for the user and the economics of the business case for the public Wi-Fi hot spot. Security is being addressed in the transmission layer of Wi-Fi with IEEE 802.11i and at the IP applications layer with standards- and policy-based authentication and access control. Economics are another matter.

The issue today with public hot spots is that flat-fee charges do not return enough revenue to pay for the cost of WAN Internet access facilities, let alone voice charges. The most advantageous approach seems to be to treat the Wi-Fi equipment and WAN access as a sales expense, embedding that overhead cost across all goods and services. The only other alternative will be on-demand or multilocation/vendor flat-fee billing at an equitable rate structure to stimulate use and recover cost.

The success of Wi-Fi is analogous to the success of the cellular industry. Technology was secondary to simplifying universal roaming and creating a sound demand-based economic and business model. The wheel turns; cellular today, Wi-Fi tomorrow.

Dzubeck is president of Communications Network Architects, an industry analysis firm in Washington, D.C. He can be reached at fdzubeck@commnetarch.com.

More on tech discontinuity

Wi-Fi's strength — and cellular wireless's weakness — is data.



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VoIP variations

Different architectural strokes from different vendor folks.

■ BY STUART MELNITSKY

When it comes to IP PBXs, products from IP-centric vendors and legacy PBX companies are characterized as much by their differences as by their similarities.

In general, the two camps can be summarized this way: the legacy PBX vendors include Alcatel, Avaya, Mitel, Nortel and Siemens; the IP newcomers are led by Cisco, 3Com, Shoreline and Vertical Networks.

The legacy vendors have an edge when it comes to the total number of traditional PBX features. The IP PBX vendors offer a more stripped-down suite of features — call hold, call forwarding, call waiting, conference calling and voice mail. But the newcomers also take advantage of the tighter integration with desktop productivity applications, such as Microsoft Outlook, giving users a unified view of voice mail, e-mail and faxes.

When it comes to other characteristics, such as basic architecture, how they provide reliability and how they support standards for features such as call control and inline power, the results are all over the map.

IP phone home

You might assume that all IP PBX vendors support IP phones, but until recently, that was not the case. The legacy vendors supported IP phones, but not upstarts Shoreline and Vertical. They held the view that the value of the IP PBX lay with the distributed architecture and the applications, not an expensive phone. Therefore, they limited their support to analog stations.

Another concern often raised about IP phones is the potential need to reengineer the corporate IP network to accommodate — and prioritize — voice traffic. Establishing quality of service entails configuring switches and routers to support 802.1p/q, type of service bits, and potentially, Differentiated Service. While these are not necessarily difficult tasks, they do require datacom expertise — either in-house or outsourced.

IP phone advocates argue that IP phones — with Web-based browsers and desktop/PDA integration capabilities — add substantially more value than their proprietary digital predecessors. As Shoreline and others have

discovered, there is enough corporate interest in IP phones to warrant — perhaps necessitate — support, which is why Shoreline and Vertical have added support for IP phones from Polycom.

Cisco has made IP phones an integral part of its architecture for voice and video (AVVID). Cisco provides support for analog devices, such as phones and fax machines, through an optional gateway, the VG-248.

For 3Com users interested in keeping their digital handsets while migrating to a NBX IP PBX, Citel Technologies offers a gateway between 3Com's IP PBXs and Nortel Norstar digital handsets.

The legacy PBX vendors, including Alcatel, Avaya and

Nortel, have incorporated support for IP phones, analog phones and their own digital handsets. IP phone support is consistently accompanied by support for G.711 and G.729a voice coders.

Topology tour

Many IP PBX vendors, including Avaya, Cisco and Nortel, rely on centralized call-control servers.

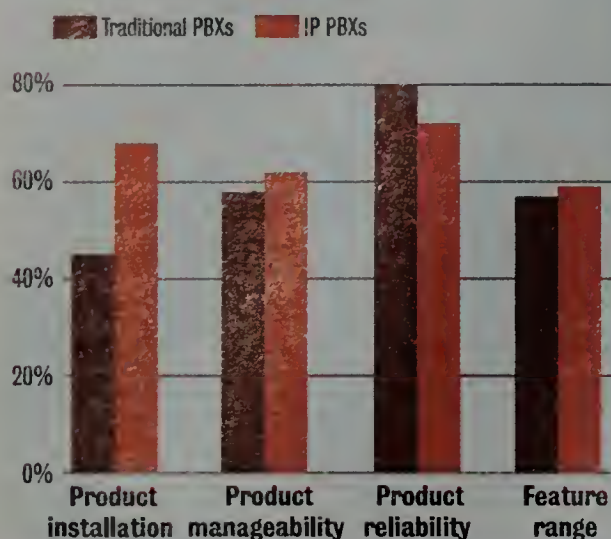
For example, Cisco's AVVID call manager sits on a Media Convergence Server (MCS) running on Windows 2000; Nortel's Succession CSE 1000 call server runs on VxWorks, as does its Signaling Server; and Avaya's Session Media Server runs on a dedicated Linux server.



ENRICO VARRASSO

IP PBX customer satisfaction

According to a Sage Research survey, IP PBXs received higher satisfaction ratings than traditional PBXs in several categories.



The potential problem with these centralized call-control server architectures is the dreaded single point of failure. However, there are ways to mitigate this problem.

For instance, Avaya addresses reliability through a redundant, dual-processor configuration; if one goes down, the other assumes the call-processing load. Similarly, Nortel supports redundant Signaling Servers.

Cisco approaches the issue of high availability a bit differently, introducing an element of distribution through server clustering. AVVID supports clusters of up to 10 CallManagers over LAN or WAN links to provide failover and load-sharing support.

Clustering approach

A cluster can support one or more device pools. Within each cluster, there is a primary CallManager, and designated failover CallManagers. These failover CallManagers can simultaneously serve as primary CallManagers in other clusters, letting large sites set up multiple, overlapping clusters to maximize survivability.

Cisco's IP phones can be configured to signal a primary MCS, as well as back-up MCSs, in case the primary MCS becomes inaccessible.

Technically, this is a sound approach, but it requires buying additional AVVID MCSs. This might be acceptable to large companies, but might not fit the budgets of smaller organizations. Also, this approach doesn't necessarily address the requirements of small branch offices, where it doesn't make economic sense to deploy an MCS.

What happens when one of these small branch offices loses its WAN link and cannot reach a stand-alone MCS or cluster?

Cisco's response is survivable remote-site telephony, an IOS-based option for routers and Catalyst switches (which might require an IOS upgrade) that provides limited call processing back-up functionality in the event the Call Manager becomes unreachable.

Avaya and Nortel also employ local survivability techniques with their Succession CSE 1000 and S8700 Media Servers, respectively. Call-server and signaling functions, in the form of processor boards, can be distributed to gateway devices — Nortel's Media Gateway and Avaya's branch office S8300 Media Server/G700 Gateway — for temporary, local call-processing capabilities.

By contrast, Shoreline's Shoreline4 is based on a more distributed call-server architecture. Each ShoreGear voice switch has gateway and embedded call-control software, running on VxWorks. If a voice switch goes down, its effect is localized; users connected to other switches still have access to their own call-control server. Shoreline

plans to extend this survivability to voice applications such as voice mail through a distributed application server architecture, in the second quarter.

From a deployment and management perspective, Shoreline presents a less-complex alternative to the clustering and SRST-like techniques of the other vendors.

However, Shoreline's recent support for IP phones has introduced a new issue. Shoreline's IP phones are set up to signal designated gateways (which reside in Shoreware voice switches). If a switch fails, or becomes unreachable, manual intervention is required to switch over all the associated IP phones to a new gateway. A future Shoreline release promises to automate this fail-over function, the company says.

For management, most IP PBXs rely on Web servers — either stand-alone or implemented on the call server's main controller, while a browser or Java application is used to access and configure management data. In most cases, Web-based management is sufficient. However, configuring Cisco's AVVID requires some command-line interface expertise for the associated switching and routing infrastructure.

Standard stew

When it comes to call control, signaling, interswitch communications, and even in-line power for IP phones, some vendors are adhering to standards; others are not.

For example, Avaya and Siemens support H.323. For its recently released IP phones, Shoreline is using media gateway control protocol, while deploying Session Initiation Protocol (SIP) for communication between voice switches. Cisco uses a proprietary standard — Skinny Client Control Protocol — for call control.

SIP continues to gain acceptance, but it's unclear if and when it will overtake H.323 as the protocol of choice.

With respect to in-line power, most vendors appear to be rallying around the IEEE's 802.3af draft for powering IP phones over Ethernet cabling. But because it has not yet been ratified, some vendors are relying on pre-standard solutions. For instance, Cisco's Inline Power is a prestandard implementation that Cisco has indicated it plans to support 802.3af once it is ratified, while maintaining support for Cisco Inline Power.

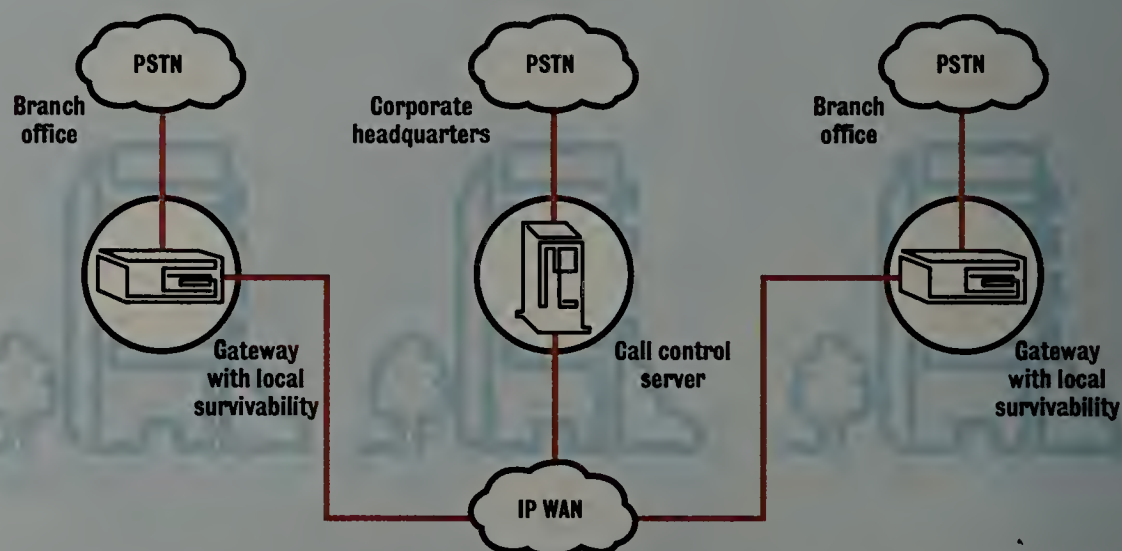
Despite these unresolved issues, the IP PBX market has matured quite a bit over the past year. As a whole, the IP PBX vendors have done a credible job of refining the functionality and resiliency of their products.

And because legacy PBX vendors are shifting their development resources away from legacy PBXs to newer IP PBX technologies, customers will have little choice but to explore this new, converged world.

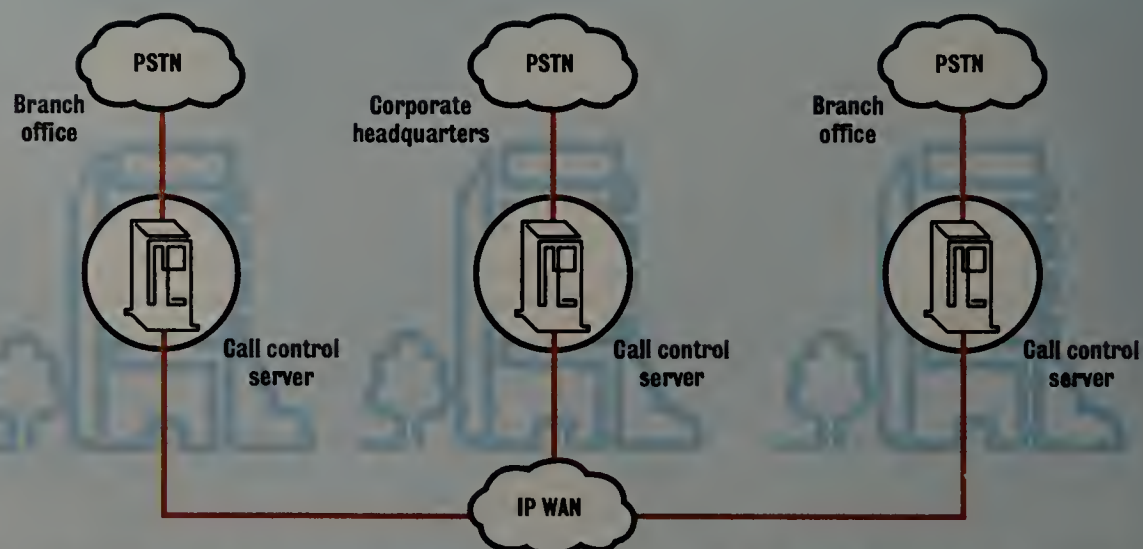
Melnitsky is a freelance writer in Massachusetts. He can be reached at melnitsky@yahoo.com.

Centralized vs. decentralized

Most vendors, including Cisco, Nortel and Avaya, rely on a centralized call-control server. Shoreline takes a decentralized approach.



In the centralized model, if a call server or WAN link fails, gateway devices can provide basic functions and features. For server redundancy, Cisco offers clustering, while Avaya has a dual-server configuration.



With Shoreline's distributed architecture, each voice switch has its own call-control software and gateway. There is no server redundancy, but a switch failure affects only the population of phones connected to the specific switch.

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Gushing over Linux

Petroleum companies rely on cluster computing for oil exploration.

■ BY PHIL HOCHMUTH

The oil and gas industry was once the province of the world's fastest supercomputers from makers such as Cray and IBM. But recently, industry heavyweights such as Amerada Hess, British Petroleum, Conoco and Shell discovered that large Linux clusters are capable of tackling the massive computational tasks involved with finding oil.

"Linux clusters are moving in and becoming very competitive in areas where large Unix clusters were used in the past," says Bill Claybrook, an analyst with Aberdeen Group. That's because Linux clusters cost between five to 20 times less than proprietary high-performance computing systems that require small fortunes to acquire and maintain.

"You can probably run 80% of the applications used in high-performance computing just as fast on a Linux cluster and at a much cheaper price," Claybrook says.

Clusters cut costs

Hess migrated from IBM's supercomputer Unix cluster, or SP system, to clusters of inexpensive Linux PCs over the last five years, as the company became more familiar with Linux and saw the financial benefits of making the switch.

The Houston petroleum company uses a cluster of 320 workstations running Red Hat Linux to process 3-D models of underground geological structures used for locating oil reservoirs. The cluster works by breaking up large amounts of mathematical data and distributing pieces of the problem to the nodes, which are a mix of Dell, HP and IBM machines with dual Pentium IV processors with about a gigabyte of memory each.

Each node works on its own part of the model, then returns data to a "master" Linux cluster node attached to a tape drive. The drive then writes the results to tapes, and Hess geological experts analyze the data to locate oil reservoirs.

Jeff Davis, a systems programmer who manages the Linux cluster, says the change has let Hess acquire more computing power at a fraction of the cost of the IBM SP. The SP cost about \$1.5 million per year to maintain and run, whereas the company purchased its first 100-node Linux cluster for around \$150,000. Yearly maintenance costs for the cluster run about a quarter the cost of the equipment, Davis adds, noting that clusters now can be added for about \$100,000.

"The SP was a first-class machine, but you paid for every bit of it," Davis says. "For the most part, these are very reliable machines in the Linux cluster."

SP provided superior uptime — the SP

system had been up for two years straight before it was taken down — but Davis says the trade-off was acceptable.

"Most of the problems we do have are not due to Linux," he says, referring to reliability issues with PC hardware components in the cluster. That was expected, he adds. "What we're talking about here is going from top-of-the-line server platform to basically desktop machines," he says.

Disclosing the drawbacks

Aberdeen Group expects Linux clusters to become the dominant platform for high-performance computing in research firms and private industry by next year, as more users of high-end systems replace older supercomputer infrastructure with Linux boxes.

While the price/performance upside to Linux clusters is huge, Claybrook says companies make some sacrifices when switching from a supercomputing platform to Linux.

One of those is speed. While Linux clusters break down problems quickly by distributing workloads, collecting data from many small machines can introduce latency not seen with larger supercomputers, Claybrook says. Also, Linux clusters are not tied together as tightly as a Unix equivalent, where clustering software is close to the operating system.

One company that is working to tighten Linux cluster operation is Linux Networx, which mixes Linux-based Intel clusters and proprietary software to create systems with more of a single-image appearance. Shell International Exploration & Production (Shell E&P) installed a cluster of 112 Linux nodes with the help of Linux Networx.

Since the mid-1980s, Shell E&P used supercomputing platforms from Cray and clustered Unix systems to perform such tasks as geological simulations of underground oil reservoirs.

The firm ran into technical and financial problems with these approaches, says Jim Clippard, a senior research geophysicist who works for Shell E&P in the Netherlands. While powerful, the Cray platform was costly. And the Unix clusters used didn't have very fast interconnects among

machines, which limited the kinds of algorithms the company could run on the clusters.

Shell E&P went with a Linux Networx cluster with Gigabit Ethernet interfaces connecting all 112 nodes, allowing for ample interconnect speeds. Now Shell can scale its processing power beyond what it previously had, because it can add a new Linux-based processor for about one-tenth the cost of adding a new Unix clustered node, Clippard says.

This scaled-up processing power lets the company's research programmers create new algorithms for modeling geological structures that were not previously possible. Buying the amount of Unix or Cray processing

OIL AND GAS INDUSTRY: AT A GLANCE

- **Worldwide oil revenue:** \$400 billion in 2002, according to Newcastle University.
- **Cost to produce a barrel of oil:** \$6.33 in 2001, according to research from John C. Herold Inc.
- **Oil and gas IT spending:** \$85 billion in 2002, Gartner reports.
- **Oil and gas company capital spending:** \$158 billion for 2001, according to John C. Herold Inc.

power necessary to run some of Shell's new programs would have been cost-prohibitive, he adds.

IBM also has been active in helping its petroleum customers migrate to Linux-based clusters, and Linux- and Unix-based hosted grid technology for seismic research computing. Earlier this year, IBM also began a hosted supercomputing service in which research-focused customers can tap into a cluster of Intel- and PowerPC-based servers hosted at an IBM facility in Poughkeepsie, N.Y. Users pay to tap into a grid of more than 100 IBM eServer p655 Unix servers and Intel-based eServer x335 and x345 systems running Red Hat Linux. For oil companies with only periodic needs for supercomputing applications, the rent-a-cluster approach has proved useful.

PGS Data Processing, a petroleum research firm working on seismic imaging in the Gulf of Mexico, now scale real time to handle requests for urgent supercomputing needs as they arise, says John Gillooly, vice president of Western Hemisphere Data Processing for the company. Much of the project work is dedicated to data collection on oil platforms rather than in a computer room. "On-demand supercomputing ideally suits our business requirements for emerging technologies that require short periods of intensive computing," he says. ■



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Face-off

Is the enterprise ready for end-to-end wireless LANs?

Two technology execs debate whether companies should start using wireless LANs today.



YES, by Doug Klein



NO, by Merwyn Andrade

The enterprise is ready for wireless LANs for three reasons: replacing cable with wireless gives companies an instant ROI; deployment issues have established solutions; and rollouts are well under way. One wireless access point typically saves a company significantly more than the labor cost of running wire. Multiply these savings by thousands of users, and it's easy to see why access points are rapidly appearing across companies.

Although to some the phrase "enterprise wireless LAN" implies a network of hundreds of access points, most companies deploy tens of access points, not hundreds or thousands. A wireless LAN with 20 access points easily serves 1,000 users. So the most pressing deployment issues are not how to manage large numbers of devices, but how to manage the rights and services for hundreds or thousands of users.

In an enterprise environment, the IT organization maps corporate policies onto the computing and network infrastructure. Users are granted access to resources based on their identity, role in the organization and other related factors.

In the wired LAN, these policies are applied to physical ports in the switching fabric — the ports where specific users connect. This model is completely flawed for wireless LANs, where radio signals bleed through walls, shared access points connect multiple users and mobility implies a mix of users at any access point.

The objective is to support user mobility while letting administrators apply network access policies appropriately. Administrators should be able to use the same policy servers for the wireless LAN as they do for the wired LAN. Ideally, a system should support multiple standard authentication mechanisms for maximum flexibility. Control must not rely on any physical device, but instead reflect the user's identity, time of day and current location.

In addition to maintaining network security, the ideal approach assures the integrity of user data as it travels across the "open" radio network on its way to the wired LAN. The system needs to support the varying needs of data encryption, ranging from none (open, insecure access) to very high (VPN-level data security).

Network access policy and security requirements must survive in an environment where users are moving. Any system that requires user intervention (re-logging on, reconfiguring devices) to fulfill the organization's security requirements will fail. And as the network grows, the system must scale to supply consistent levels of mobility, security and control, as well as adapt to support new and evolving standards.

By implementing a wireless LAN with awareness of the issues and requirements for a secure network, IT organizations are embracing this technology, improving user services while delivering the security and integrity that modern network practices demand.

Klein is CTO of Vernier Networks, a developer of wireless network infrastructure systems. He can be reached at klein@verniernetworks.com.

Until tools are available that will let network managers effectively deploy, secure and manage wireless LANs, 802.11 technology will continue to languish in the enterprise. Without a structured architectural blueprint by which companies can operate and scale wireless LANs, extending them across the campus will be more complex and costly than using current technology.

Two huge obstacles are stifling enterprisewide adoption of wireless LANs: mobile security and deployment. With wireless LANs, your network is now in the air. Consequently, it's essential to have a clear view and complete control of the airspace. Not only must you be able to identify malicious users and rogue access points, but also take action automatically against unauthorized activity.

Today's wireless LAN appliances are point products that address only a one aspect of the security problem. To deploy a secure wireless LAN with these products, an appliance is needed that detects rogue access points, another that does user authentication and access control, and yet another that terminates VPNs. Network managers cannot live with such a disjointed approach to wireless LAN security. An approach that addresses all aspects of security and lets network managers quickly enact changes across the wireless LAN is key to enterprise wireless LAN deployment.

In today's wireless LAN model, security and wireless intelligence are largely distributed in access points — which is difficult to manage and a nightmare to upgrade. This leads to the second obstacle: large-scale deployment. Simply put, given the limitations of wireless LAN technology, companies have found it next to impossible to deploy wireless LANs beyond small pockets.

Clearly missing is the ability for network managers to capture 802.11 packets out of the air and process those packets centrally. This is essential to troubleshooting wireless LANs, monitoring station-to-access point associations, evaluating traffic flows, load balancing traffic, automating around failures or changing channel and coverage settings when traffic patterns change. Without such capabilities, network managers cannot build and manage large wireless infrastructures.

But new wireless LAN switching technology has emerged to give network managers a centralized model and the tools necessary to deploy, scale and secure enterprise wireless LANs. A centralized switch in the wiring closet or data center controls and coordinates access points that provide user access and air monitoring. All changes to and control of the wireless LAN is streamlined and automated. This lowers operational management costs, solves the security upgrade problem and radically simplifies deployment — leaving users unplugged but well-connected.

Andrade is director of technology at Aruba Wireless Networks and is a contributor to the IEEE 802.11i security specification. He can be reached at merv@arubanetworks.com.



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Log on to Network World Fusion to voice your opinion. Face-off authors Doug Klein and Merwyn Andrade will add their thoughts to the discussion.

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Where the jobs are

Despite the economic malaise, there are still pockets of industries that have IT openings.

■ BY LINDA LEUNG

Virginia mortgage investment firm Freddie Mac is enjoying rich pickings in its ongoing quest to expand its IT workforce as resumés fly in from IT workers laid off from local high-tech firms such as AOL Time Warner and WorldCom.

In mid-March, Freddie Mac had 20 openings in its IS division, as compared with 30 IS openings at any given time in 2002 and 60 in 2001. However, Freddie Mac as a whole receives 10,000 resumés per month, says Bill Ledman, senior vice president of IS and services. The company employs about 1,000 IS workers and attributes its growth to the refinancing boom.

"We sit in the Dulles corridor — the

second quarter of 2001. However, 5% said they would cut their workforces in the second quarter of 2003 — the highest percentage of executives since the second quarter of 2001. A full 86% of executives planned no changes in hiring activity.

Many CIOs are keeping hiring plans on hold because of continued economic uncertainty, says Katherine Spencer Lee, executive director at Robert Half Tech-

work professionals. Some 29% of CIOs from the professional services sector — the highest number of CIOs from any sector — experienced the greatest demand for network experts.

One industry with growing staffing needs is the military IT services sector, reflecting the government's bid to beef up the nation's security. BAE Systems' Information Systems Sector (ISS), which provides IT systems and services to the intelligence and military communities, plans to hire between 500 and 700 technology experts this year; while network services provider Wamnet Government Services is searching for 500 IT professionals nationwide in 2003.

Wamnet is a subcontractor to EDS for its \$6.9 billion Navy Marine Corps Intranet (NMCI) contract, and 420 of those new hires will work on that project. The remaining 80 will work on Wamnet's other government contracts. There are currently 170 openings for senior, mid- and entry-level network executives for the NMCI deal. Wamnet expects to hire 80 people per month, peaking with 200 job offers in the summer.

John Heller, a senior executive at Wamnet, says the company receives between 20 and 100 resumes per job posting from "some very qualified people." One-third of the applicants are people who already work at the Navy bases, either for the Navy or other contractors, and others are candidates who have carrier-class network experience from various Baby Bells nationwide. Attracting those individuals is no easier task because of the state of the economy. "The majority of applicants are gainfully employed and somewhat sought after," says Mike Barbee, Wamnet's president and general manager.

John Sebra, senior director of human resources at BAE Systems ISS, agrees. The firm has openings for software and systems engineers but finding the right fit is a challenge because applicants need to pass security clearance by a government agency and be comfortable working in a structured environment. "There's a great

deal of competition for these candidates," he says.

Although Kvaerner's Erana says the market for job hunters in Philadelphia is brutal, attracting and retaining talent is still tough. "There is a flight risk of the people I'm looking for," he says, adding that he's not rushing to find the right fit.

Erana says many of the people who were laid off are midlevel, while "the senior guys are never let go."

"There are a lot of people out there from the former regional Bell operating companies, but they have tunnel-vision skill sets and don't have enough enterprise expertise," he says. "They can configure Cisco switches, but do they know [quality of service, voice over IP] prioritization?" ■



The majority of applicants are gainfully employed and somewhat sought after."

Mike Barbee
President and general manager, Wamnet Government Services

heart of the Internet. Because of the tech crash, we have a lot more people to pick from," Ledman says.

Michael Erana, CTO at Kvaerner Philadelphia Shipyard, received 200-plus resumés when he recently advertised a CAD coordinator position. "I received far more than I could go through; I felt bad," he says. Now he relies on word of mouth.

Erana's eight-person IT team supports the shipyard's 1,500 employees, and he is looking to add a senior Unix administrator, a part-time Web developer and up to three desktop support specialists.

According to a recent quarterly hiring index, firms such as Freddie Mac and Kvaerner are in the minority. Of the 1,400 CIOs polled by recruiter Robert Half Technology, only 9% planned to increase their IT workforces in the second quarter of 2003 — the lowest percentage since the

nology. However, "Many of our clients tell us it's not all gloom and doom," she says. "They will spend but they want to see convincing signs of economic rebound."

Sixteen percent of the IT executives hiring are in the business services and transportation sectors, while only 1% of leaders from the same sectors planned job cuts. Managers from the financial, insurance and real estate services sector followed closely behind, with 15% saying they would hire, compared with 9% of their industry colleagues who foresaw a drop in workforce.

Of those hiring, 54% said business growth was the primary driver for increasing IT staff, followed by systems upgrades at 16%. More than one-fourth of CIOs (28%) wanted to boost their help desk/end user support departments, while 23% wanted to increase the number of net-

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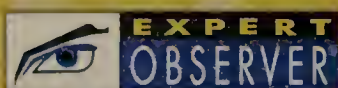
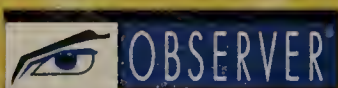
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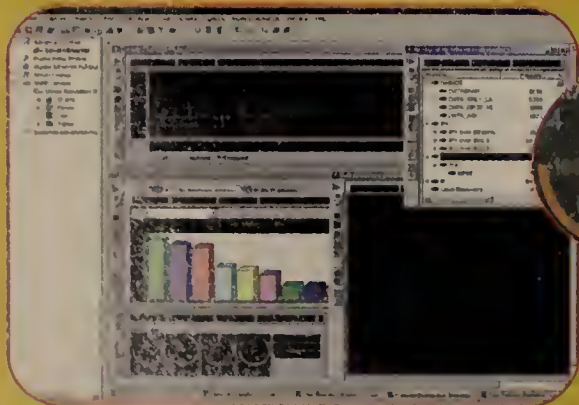
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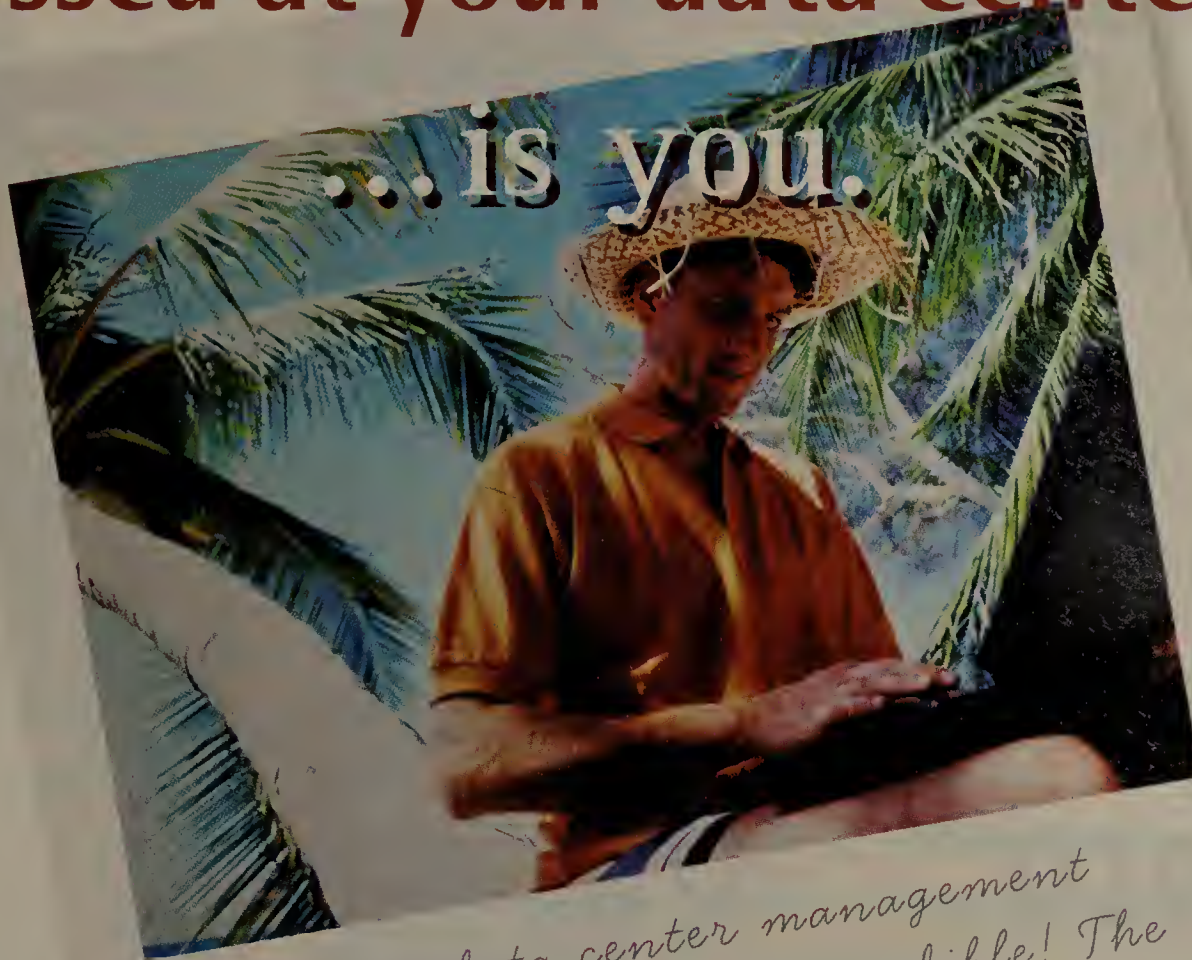
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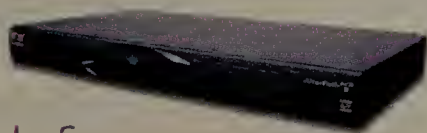
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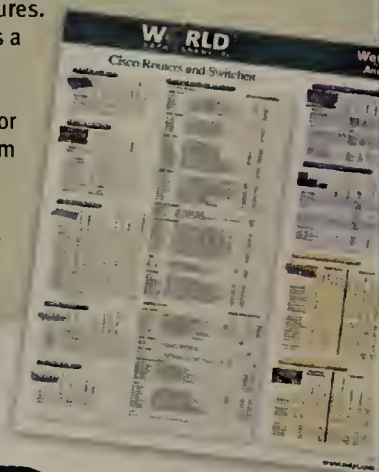
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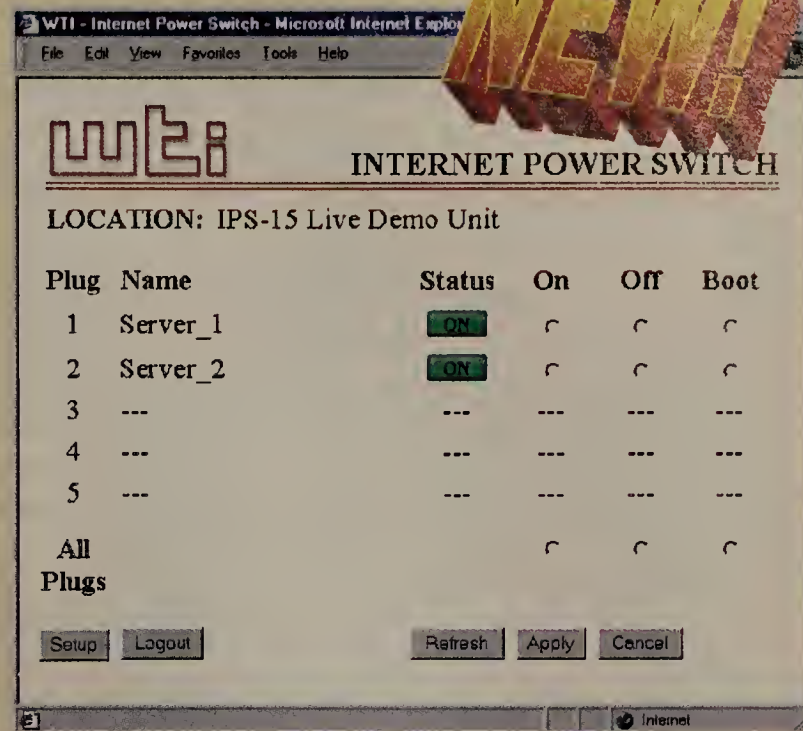
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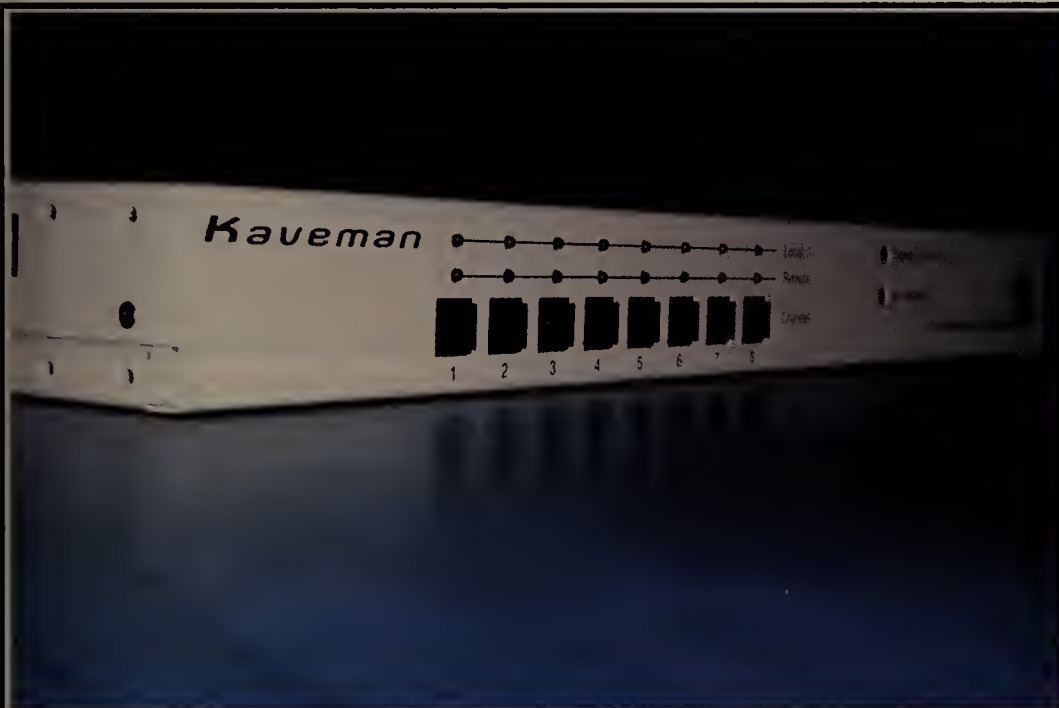
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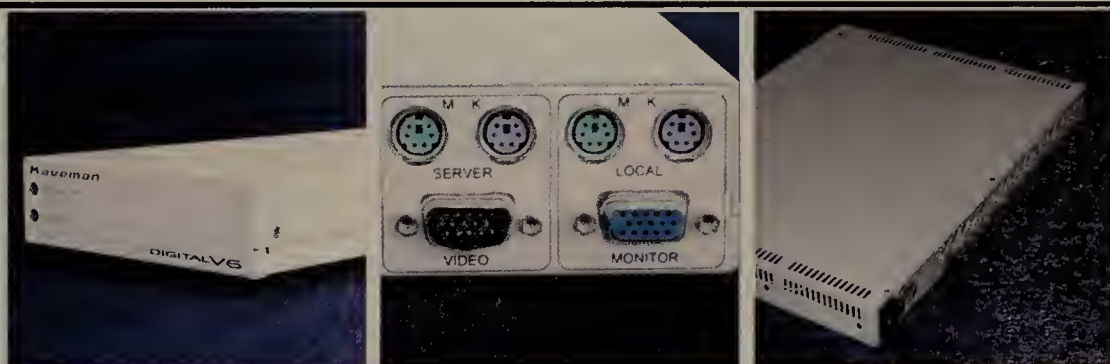
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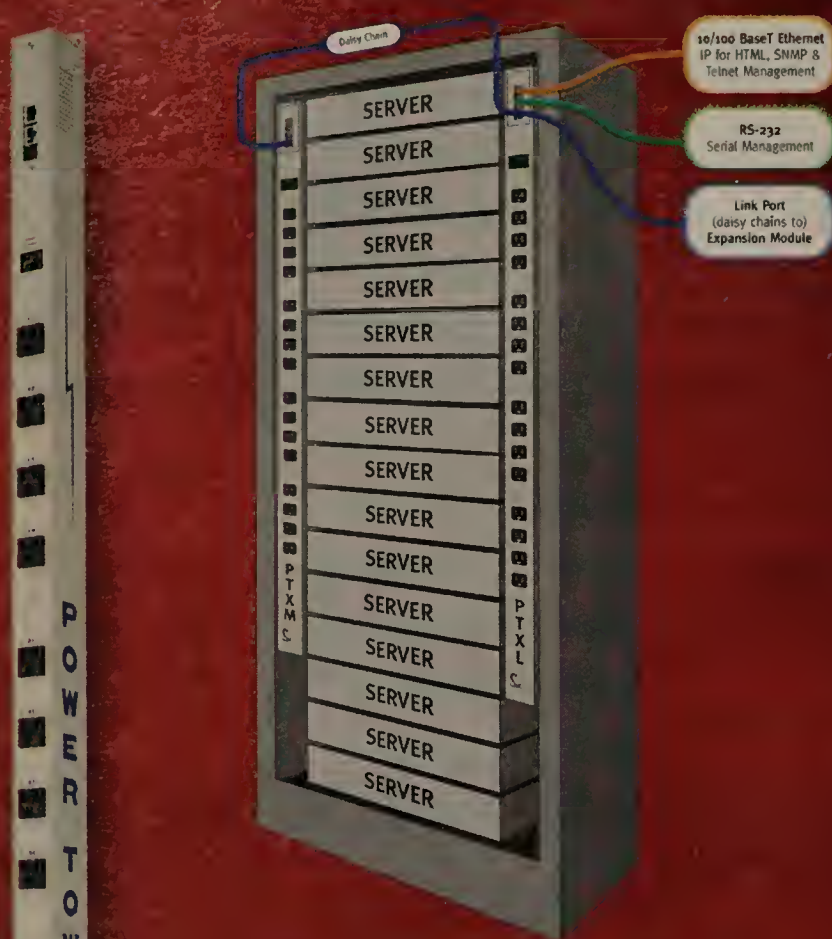
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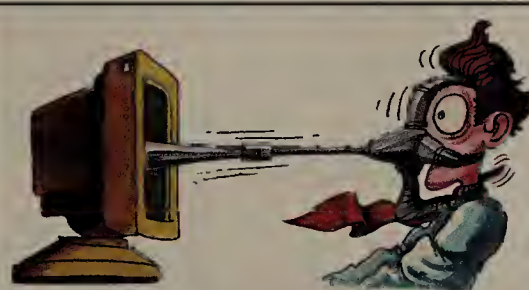
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Our Division is the perfect environment to allow your technical juices to flow and, in turn, be applied toward the betterment of our business products. What's more, you'll be surrounded by others who share your passion. A team of professionals who are eager to exchange ideas and driven to put them into action.

Manager, Technology Systems

This position is responsible for managing and maintaining Canon's technical support system's infrastructure, which includes CRM systems, Knowledge base, Learning Management (LMS), and Web Services. This role has three main aspects: technical architecture planning, implementation and support services. The ideal candidate understands hard-core technology, application development and platform issues, yet has the interpersonal skills and broad business acumen to work well with internal clients and external consultants, understanding the strategic business focus of each project.

We require minimum 5-7 years experience in a technology driven environment, a Bachelor's degree, excellent communication skills and a keen understanding of web application technologies. Remedy Action Request (AR) System Implementation and deployment experience a big plus.

Manager of Service Business Operation and Administration

We seek a dynamic, strategic leader for a newly created position directing the specific activities of our Imaging Systems Office Equipment Service & Support area. In this position, you will work closely with office equipment dealers in measuring machine performance and overall service effectiveness. Using project management skills, you will help enhance communication and dealer recognition programs aimed at improving end customer satisfaction with Canon brand copiers.

You will need a Bachelor's degree and 4-6 years of experience in office equipment service operations. Proven leadership ability and proficiency with Microsoft Office also required.

Manager, Engineering Services

Providing a key leadership role for planning, managing, and administering the Hardware Engineering functions for digital printing high-end product lines, you will lead a team of technical engineers in pursuit of delivering customer support for Canon's world class printing products. In addition, you will direct the support team to perform product evaluations, resolve challenging customer issues and create and distribute technical product information.

We require a Bachelor's degree, minimum 5 years office equipment service support experience in a supervisory position, excellent communication skills and a technical aptitude in office equipment. An understanding of High-End Customer (CRD, Data Center) document workflow and applications is essential.

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TadSoft, Inc. is looking for a Software Engineer/Web Developer responsible for analyzing user requirements and designing web based (internet/intranet) systems; coding of these systems using Microsoft's ASP/CGI technologies on the server side and using Java Scripting on the client side for Internet Explorer/ Netscape Navigator browsers; interfacing relational databases on the server is a major component of the server side coding. These databases include but not limited to Sybase/IBM DB2; batch coding using Microsoft's VB Script and Java and installation of these batch programs in the system; data migration between different database platforms and/or external vendor systems and data loading using the above mentioned technologies. A bachelor's degree in Engineering is required. Salary \$66K. Submit 2 copies of resume to Job Order# 2003-181, P.O. Box 989, Concord, NH 03302-0989

Analyst/Project Programmer

The Medical College of Wisconsin is seeking Analyst/Project Programmers for its Bioinformatics Research Center. The Analyst/Project Programmer is responsible for working with project scientists and other project collaborators to design, develop, implement, and provide maintenance support for web database applications for biological and medical scientific research. Qualified candidates must possess a Master's degree in Mathematics or Computer Science (with a background in biological science), or Biological Science (with a strong background in computers). Interested applicants please provide a resume and a cover letter with salary requirements to:

Employment Office - JMC0402
Medical College of Wisconsin
8701 Watertown Plank Rd.
Milwaukee, WI 53226
Fax: (414) 456-6502
EOE M/F/D/V

Software Engineer - Responsible for design & development of the company's Business Process Manager product; specific duties incl: maintain system/application software; design & develop applications using Object Oriented & XML-based technologies & specifications, Enterprise Application Integration (AI), & Web based technologies; develop & extend advanced complex software system in a reliable & modular fashion using Java and XML based technologies. BS in Computer Science and 2 yrs. of software engineering experience using Java (J2EE), XML-based technologies, Web based technologies (HTTP, SMTP, POP3); proficiency w/ Web Security Protocols (SSL); & ability to work on Unix environment & Clearcase. 40 hours/week; Salary: \$90,000/yr. Send two resumes to **Case #200115822**, Labor Exchange Office, 19 Staniford St 1st Fl, Boston, MA 02114

SENIOR PROGRAMMER/ANALYSTS

MARA CONSULTING, INC., a California-based Corporation, has immediate openings for Senior Programmer/Analysts with at least five years' experience in Natural/ADABAS/Programming who have worked on IBM mainframe platforms utilizing MVS/XA ESA and OS/390 Operating Systems. Applicants must also have at least four years of formal academic training in computer data processing, Computer Science or a related field culminating in government diplomas or a Bachelor's Degree. Must be willing to travel from the Sacramento, California area to temporary work sites throughout the United States to be paid, at least, the prevailing wage in that area. Employees will remain employed by MARA CONSULTING, INC., (www.maraconsulting.com) with continuing benefits. Send your resume with current address and telephone number to MARA CONSULTING, INC., 8577 Almond Bluff Court, Orangevale, CA 95662 or email to maracons@pacbell.net. EOE

Full-time Technical Project Manager. Multiple Openings. Manage the design, development and implementation of business software solutions for client companies, utilizing expertise in Microsoft technologies, including Microsoft .NET, UML, and Rational Rose; position requires extensive technical mentoring of systems analysts, business analysts and client end users. Must have five years Microsoft development experience, including at least 2 years of Enterprise .NET project development. MCPT Required. Must be willing to travel to client sites M-F, and have proof of legal authority to work in the United States. If interested, submit resume to: Jennifer Allen, Extreme Logic, Inc., Two Concourse Parkway, Suite 500, Atlanta, GA 30328.

Operations Research Analyst. 8a-5p, 40 hrs/wk. Analyze operational data, formulate & apply mathematical models to develop decision support s/ware for streamlining operations; provide logistics report; implement, test, maintain program using Visual Basic, MS-Access, SQL, Crystal Report & Windows NT. Bachelors or equivalent degree in Mathematics, Statistics, Operations Research, Information Systems, Computer Science or Engineering or related field. Send resume to: Ramji-Krupa, Inc. dba Days Inn, 5701 Baltimore National Pike, Baltimore, MD 21228.

Project Manager - IT wanted by Producer of Vitamins & Fine Chemicals in Parsippany, NJ. Must have Bachelor's degree or foreign equiv. degree in a quantitative, business or other technical discipline and 8 yrs. exp. in job offered or IT experience. Experience must include 3 yrs. of SAP experience in Materials Management and Production Planning, experience with Materials Requirements Planning (MRP), and experience with vitamin blends formulation. Respond to Roche Vitamins Inc., Attn. Human Resources, Dept. code WHR, 45 Waterview Blvd., Parsippany, NJ 07054-1298; fax: (973) 257-8419; or e-mail: parsippany.human_resources@roche.com.

Quantitative Analyst wanted by Manhattan Securities Clearing Firm to conduct risk analyses and modeling projects. Must have 2 yrs. exp. with database administration/application design & C++ programming. A Master's degree (or completion of all Master's coursework) in Financial Engineering or in a related field is required. Fax resumes to HR Dept., DTCC (212) 855-5802. Refer to Job #8071.

Glovvia Int'l, El Segundo, CA Business Development Manager (Supply Chain)

Associate's (or equiv.) +8 yrs progressive exp. in Supply Chain & ERP solutions, pre-sales consulting, IT technical & business infrastructure & ProIV programming. Function as recognized leader in Supply Chain Solutions by develop staff/execute team programs; develop customer relationships; manage business systems & contribute to develop of intellectual capital. Requires 80% domestic/int'l travel. Manage staff in delivery of pre-sales consulting services in Supply Chain & ERP software solutions w/ responsibility for budgets of \$1.5M. Develop business strategy to expand customer involvement with company's vertical market-specific discrete mfg. applications using ProIV. Resume to: HR2@glovvia.com in MS Word format.

Computer - Programmer Analysts needed. Seeking qual. candidates possessing MS or equiv. and/or rel. work exp. Rel. exp. must include 2 yrs. working with Java, Oracle & Weblogic. Work with 3 of the following: Oracle, Weblogic, Java, Websphere, Rational Rose, Sybase and XML. Fwd. resume & ref. to Enterprise People, Inc. Attn: HR, 109 Mayfair Dr., Boxborough, MA 01719.

Process Engineer (multiple positions): Develop and support the engineering functions of the wafer fabrication area. Develop process of ion implantation in SiC monocrystalline substrates, definition of process, training and certification of operators, qualification of process, process control measurements, tolling selection and procurement, and leading cost reduction and process control efforts. Bachelors degree in Electronic Engineering and 2 years prior experience required. \$80,000/yr. Send resumes to: Cree, Inc., 4600 Silicon Drive, Durham, NC 27703, (attn: HR) EOE/M/F/H/V. No phone calls please.

Quality Control Engineer/Localization Specialist needed. Seeking candid. poss. MS/BS or equiv. &/or rel. work exp. 6 mos. of the req. rel. exp. must incl. documenting Quality Assurance processes. Duties include: design and maintain automated & performance tests and draft detailed test plans, specifications, strategies & estimates. Mail res. and ref. to Centra Software, Inc., 430 Bedford St., Lexington, MA 02420, ATTN: HR req. #36

S/W Engineers to analyze, design, develop, maintain business apps using Java, XML, JavaScript, HTML, DHTML, XML, COM/DCOM, PLSQL, Oracle, etc on Windows OS; analyze business processes to determine client reqs; maintain documents/program specs; create appl prototypes for client approval; perform research, analysis, testing of new/existing technologies. Require. Masters or foreign equiv in CS/Engg/Physical Science/Business discipline with 1yr exp in IT. High salary. Travel involved. Resumes to: HR, Synergy America, 1565 Woodington Circle, Suite 101, Lawrenceville, GA 30044.

Senior Software Engineer Lead, model, analyze, design and develop applications using Multi-Tier Client/server internet, intranet, e-commerce solutions and technologies and object-oriented methodology including Java, MSAccess and XML/XSL. Must have Bachelor of Engineering in Comp Sci., Eng. or related Field and 5 years of experience in software development. Knowledge of Multi-Tier Client/Server applications including Java, MSAccess and XML/XSL. 40hrs/wk (9:00 a.m. to 5:00 p.m.); \$100,000.00/yr. Send two resumes /responses to: Case Number 200115555, Labor Exchange Office, 19 Staniford Street, 1st Floor, Boston, MA 02114.

Software Developer for text analysis and development of programs in many languages esp. Korean + development of categorization extraction and email alerts software. Reqs: Masters + 0 experience or Bachelors + 2 years experience. Fluency in Korean. Send resume to: Teragram, 236 Huntington Ave. #302, Boston, MA 02115, Attn: Yves Schabes. NO CALLS.

Software Developer: plan, develop, test and document computer programs; evaluate users' request for new or modified program; consult with users to identify and clarify program objectives; analyze, review, and alter program to increase operating efficiency or adapt to new requirements; and assist users to solve operating problems. Req. BS in CS or related field plus 10 months exp. in job offered or as Programmer. Must be proficient in J2EE, Unix/Solaris, UNIFY, VoiceXML and Multi-threading. 40hr/wk, 9-5. Contact Donnelly Communication, Inc. at 1776 Peachtree St., Suite 200, Atlanta, GA 30309.

Technical Consultant (Programmer Analyst) - Will provide database implementation, configuration & customization under Windows 2000 & SQL server environ.; design, develop & customize applications & systems as per customer's needs & requirements; implement solutions using ONYX software & web based CRM systems and other cutting edge technologies. Master's in Comp. Sci., Engin., Math or related field & knowledge of RDBMS, SQL, programming web applications & virtual office implementations. 40 hours/week; Salary: \$68,450/yr. Send two resumes to **Case #200116087**, Labor Exchange Office, 19 Staniford St 1st Fl, Boston MA 02114.

Systems Analyst - Uses systems analysis skills to analyze Latin banking systems & business req. Designs, dev. & prog. Software for integrated banking systems in Latin America Banks & financial institutions. Works w/ IBM, AS/400, RPG, ILE, static programming w/ servlets. Designs teller attn systems incl. (Sarabank Safe, IBS Branch) 40 per wk 9A-6P, 3 yrs req. in job offered. Fax resume to Datapro, Inc. Attn: William Montiel (305) 929-4182.





Manager, Software Engineering

Wave Three Software, Inc. is a privately held, cutting-edge engineering company that develops and licenses software for desktop communication and collaboration. We are currently looking for a Manager of Software Engineering who can lead our team in taking the existing product suites and creating the VVoIP products of the future.

The successful candidate will be hands-on in the designing, coding, testing and delivery of the software products. A Bachelor's degree in Computer Science or Computer Engineering or working equivalent, and a minimum of five year's experience creating industry leading audio/video communications software is required. Excellent knowledge/experience with C/C++ programming, object-oriented design, software design and development tools, software optimization and real-time software development is required. A solid foundation and working knowledge of audio and video encoding and decoding algorithms and techniques as well as exposure to multiple platforms and networking concepts (PC, Mac, Unix, TCP/IP) is required. Prior experience with developing networking solutions for IP and telecommunication signaling and data protocols including a working knowledge of H.323, ISDN, ATM, SIP, SDP, RTP. Superior written and verbal communication skills are also necessary. A proven track record of leading a project from beginning to end is a must. Prior experience working in a shrink-wrapped software environment is a plus.

Only qualified candidates are encouraged to e-mail their resumes in Word format, to resume@wave3software.com. EOE.

**Software Engineers/
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(St. Louis, MO):**C/C++ Development:**

Develop syst. communication infrastructure, implement server logs, develop syst.mgmt. appls. using OOD methodology, C/C++, Pro C, V/C++, VB, SQL, UNIX, Oracle, Shell Scripts, UML, TCP/IP, and AIX.

Java Development:

Develop multi-tier OO web-based info. Syst. on J2EE architecture in both NT and Unix enviro. using C/C++, Java, VB, EJB, Servlets, Jbuilder, Java Beans, JDBC, JSP, XML, SQL, Oracle, Websphere, and UML.

Network Administration:

Plan/program network and web appls. for large scale LAN/WAN networks in UNIX/NT enviro. using TCP/IP, BGP/OSPF protocols, Cisco Internet Router (1000+), MPLS/VPN, SNMP, QOS, Checkpoint, VPN, VoIP and Nokia Firewall; analyze complex circuit / networking / routing issues; direct network testing procedures.

Require BS/BA or the equivalent in Comp. Sc., Engr. Math. or in a closely related field (will accept equivalent exp.) plus min. 2 yrs. exp. in offered/related position, and must be able to perform all the duties in the day of employment. Full time w/ competitive salary. Resume to HR NetEffects, Inc., 500 Chesterfield Ctr., Ste.350, St. Louis, MO 63017. No Call/EOE

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NET2S, 82 Wall Street, Suite 400, New York, NY 10005; Fax: (212) 279-1960; Phone (212) 279-6565; or Email: jobus-ny@net2s.com

Senior Systems Analyst to provide hardware and software technical support to end users of company's retail management information systems. Specific responsibilities include: Providing system engineering, architecture, administration & support for Citrix Metaframe 1.8 / Winframe environment; Leading engineering team for Windows 2000 implementation; Providing technical leadership for 3rd tier Windows 2000/NT technical support; Researching system architecture and making recommendations for server infrastructure; Consulting with clients on technical needs and specification development; Coordinating & providing network related support, configuration, optimization and operation support; Testing, researching and setting up applications; Developing documentation for automated systems and procedures; Providing support with Network Management Software; Providing training to end users in software and systems operations; and Providing backup & recovery solutions to protect Enterprise data. Minimum Requirements: Bachelor's degree (or equivalent) in Electronics & Communication Engineering, plus 2 years experience in systems analysis or network engineering. Must be able to perform all of the following: Design, implementation & administration of LAN/WAN networks; Windows 2000/NT system architecture, installation, administration & troubleshooting; Optimization & troubleshooting the network environment; Citrix Metaframe/Winframe environment design, installation, administration & troubleshooting; Application/software installation & troubleshooting; Providing technical support for data access to enable data retrieval & manipulation; Network related configuration & support; and Providing end user training in applications & systems. Must be knowledgeable in data backups & restores. Salary: \$58,850 for 5 day, 40 hour week. Send 2 resumes to Case #200115344, Labor Exchange Office, 19 Staniford St., 1st Floor, Boston, MA 02114.

**SOFTWARE ENGINEER
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Software Engineer is responsible for analyzing system requirements and developing technical specifications for computer programs used in the healthcare industry. Must consult with clients to gather information about program objectives and functions, write computer code and user interfaces, and refine, test and debug programs as necessary. Also required to write and maintain documentation to describe program developments, logic, coding, testing, changes, corrections, installation and operating procedures. Must have a Bachelor's degree in Computer Science and four years of progressive experience in computer programming, systems analysis, or software engineering. Experience must include: Visual Basic, Winsock, Windows Programming, Java2, JAX, Java Threads, Java Sockets, JSP, Servlets, XML, Xerces, Apache, IIS, Tomcat, database concepts (Oracle/SQL Server), object oriented design and programming concepts with UML. Prevailing wage to be paid.

Please send resume to:

Michael Buda
SIS Acquisitions, LLC
3650 Mansell Rd., Suite 300,
Alpharetta, GA 30022

Computer Systems Analyst (multiple positions): Designs, develops, modifies, debugs and evaluates programs for use in internal systems within functional areas. Analyzes existing programs or formulates logic for new systems, devises logic procedures, prepares flow charts, performs coding and tests/debugs programs. Prepare and obtain approval of system and programming documentation. Four years of prior exp. required. \$75,000/yr. Send resumes to: Cree, Inc., 4600 Silicon Drive, Durham, NC 27703. (attn: HR) EOE/M/F/H/V. No phone calls please.

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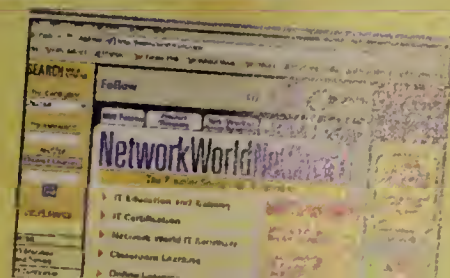
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Software Engineer: Works under the supervision of sr. mngmt. To research/develop image/graphics processing software related to the import/export of Macintosh/Windows raster/vector graphics file formats using Assembler/C/C++, design/implement scientific image processing/ image processing optimization algorithms/ client server software; determine design time/cost feasibility; evaluate HW/SW interface/ system operational/ perf. req's.; develop/software testing procedure/ programming/documentation. Req Bach. in Computer Engineering, rel. or equiv. and 1 year exp. Resume to J. Miranda, Deneba Software Inc., 1150 N.W. 72nd Avenue, Suite 180, Miami, Florida 33126. No Calls.

Sr. Database Admin. Design, analyze, test, maintain & improve logical & physical databases. Responsible for backup, recovery & tuning of databases. Calculate optimum values for database parameters & system analysis. Use Oracle, SQL server, &/or related skills. Req 4 yrs exp in job/4 yrs exp as Systems Analyst & Consultant or Asst. Syst. Anal. Or Sr. Programmer & Programmer. Jobsite: West Greenwich, Rhode Island. Send ad & resume: Yen C. Chong, Amgen Inc., One Amgen Center Dr., Thousand Oaks, CA 91320-1799. Include Ad# 02-412FV.

Sr. Software Engineer wanted by legal services info corp in NYC to be responsible for high-level architecture, analysis, design & development of mission critical web products built on Windows DNA/.Net architecture. C++, COM, DCOM, COM+/MTS/MSMQ, ALTCOM, VC++, C#, .NET, XML, ASP, JavaScript, DHTML, IIS, SQL, VB, Oracle. Resumes to HR Dept, CCH Legal Information Services, 111 8th Ave, NY, NY 10011.

Technology Support Manager - for non-profit organization to manage and implement all internal IT solutions including network support, troubleshooting, and internal helpdesks, for Windows 2000, XP, and Exchange Server environments. Position requires degree or experience. Send cover letter and resume (no calls) to A. Marano, NPower NY, 145 W. 30th St., 8th Fl, NY, NY 10001.

WTR Inc, a comp cons co. seeks to fill the following positions in Columbus, Indiana.

- Programmer Analyst with strong Oracle skills. Must have BS in Comp Sci, Engg, or Math & a min of 2 yrs exp
- Business Analyst with Oracle ERP skills. Must have BS in Comp Sci, Engg or Econ/Fin & 2 yrs exp

Mail R & CL to HR Dept, 130 W 30th St. 12th Fl, NY, NY 10001.

Opportunities in Walnut Creek, CA and Chicago. Positions may require travel.

- Tech Support Engineer (Mgr)
- Sales Engineer

Send resume to Pointsec Mobile Technologies, Inc., Attn: HR, 1333 N. California Blvd. #445, Walnut Creek, CA 94596. Fax 925-256-2501 Email: jobs@pointsec.com

Paradigm Infotech is looking for programmer/system analysts, s/w engineers. Candidate must have BS with at least one-year IT experience. Good skills in C/C++, Java, Oracle, WebLogic, VB, HTML are plus. Traveling is required. Apply jobs@paradigminfotech.com. EOE.

Synova Inc is seeking professionals with following skills: Programmer/System Analysts, Engineers in Mainframe, Web Tech, Technical/functional (SAP & Peoplesoft), Java, Rational/RUP, UML, J2EE, Unix DBA, Oracle, SOL DBAs. Respond to ads@synovainc.com.

Software Engineer: Research, dsgn & dvp software systems & GUI interfaces using Sun Solaris, Windows NT, Websphere Appln svr, MO Series, Rational Rose, VAA, JSP, Oquest Toad, DB2, Interbase & related tools. Perform functional & bus reqmnt analysis. Customize/enhance/configure/integrate s/ware systems. Dvp & direct s/ware sys testing procedure; perform unit & integration testing. Must have MS or eqvint in Comp. Sci or Comp Eng & 3 yrs exp. in s/ware dsgn & dvlpmnt. Job in Chicago, IL & other locations. Competitive Salary. Apply to HR, Pixel Information Technology Corp, 3300 W. 159th St. #206, Markham, IL 60426. FAX: 7082257763

Software Programmer. Programs software components using Visual C++ and Visual Basic; debugs existing software; designs and implements interfaces for communications servers. 2 yrs. college in Computer Science required. Two years of experience in job required. 40hrs/wk. 9:00 a.m. to 6:00 p.m. \$59,238/year. Applicants must show proof of legal authority to work in the U.S. Northwest Suburb of Chicago. Send resume to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North Chicago, Illinois 60605; Attention: Leonard Boksa Reference #V-IL 34630-B an employer paid ad. No calls-send 2 copies of both resume and cover letter.

Sr Programmer Analyst. Design s/ware solutions using COBOL, MVS, JCL, CICS, or Basic and commercial DBs. Bachelor degree in CS, Eng'g, Business, similar field, or equiv, req'd, as is 4 yrs as a Sr P/A or in a computer prog'g position. Competitive salary. Resume to James D. Cuniffe, Technical Recruiter, Sallie Mae, Inc., Job #1915.26, 11000 USA Pkwy, Fishers, IN 46038.

Programmer Analyst. Develop computer programs using Visual Basic, ASP, ER-Win, Sybase, SQL Server, C, C++, SQL, VB Scripts, PowerBuilder, Access, & Oracle. Bachelor degree in CS, or similar field, or equiv, req', as is 1 yr of exp as a P/A or in a computer prog'g position. Prior exp must include exp w/ Visual Basic, C, & ASP. Competitive salary, Austin, Texas, location; reassignments possible. Resumes to S. Puri, Job #1629.71, Business Software Assoc, Inc., 8140 N. Mopac, Bldg. 1, Ste. 130, Austin, TX 78759.

Computer Programmer. Plan, develop & test data warehouses Oracle/DB2 databases. Provide installation, implementation & maintenance support. Develop documentation. Provide technical support. Req: BS in comp. eng. 40 hrs/wk. Job/Interview site: Glendale, CA. Send resume to Satwic, Inc., 1205 N. Geneva St., Glendale, CA 91207.

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Prices

continued from page 1

Indiantown, Fla., since 2001, the last time the company renewed its two-year contract. When the company started renegotiating its contract last month, Sprint came back with a price of \$886 per month for the same line, which only covers local access for Bay State's frame connection.

"They just won't budge. We understand prices going up, I expected that, but not [by that much]," Yaworsky says.

After pressure, Sprint reduced the price of the link to \$700 per month, but Yaworsky is still disappointed. "We are resigning with Sprint. We're happy with everything else; their service is great. But now we're just signing a one-year deal," he says.

Many carriers are increasing their low-speed frame prices. Most long-haul service providers also are moving in this direction.

"Pricing on frame relay proposals is rising on low-speed services. This is such a repeatable trend one can easily generalize," says David Rohde, an analyst at consulting firm TechCalibur.

"Users who have a low-speed frame network that is served by one provider can expect difficulty with contract renewals."

That's what MoldFlow, a software company that makes products for the molded plastic parts industry, ran into with AT&T when it was time to renew its multinational frame relay contract. MoldFlow has a frame relay network that connects multiple sites in the U.S. and two overseas on links that max out at 256K bit/sec, says Rick Thimble, manager of IT at the Wayland, Mass., company.

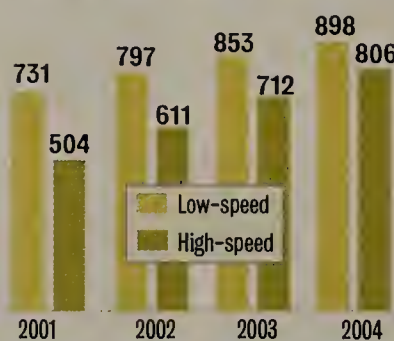
AT&T's contract proposal had prices that were nearly 20% more than MoldFlow was paying. "I was surprised," Thimble says. "We simply did not have any more dollars in the budget to support the higher prices."

Thimble considered lowering bandwidth at each site to reduce the cost of his contract, but he feared that would lead to bottlenecks because MoldFlow regularly ships software code between offices. The company explored different service options with AT&T, including its IP Enabled Frame Relay service, but Thimble says that would have cost more

High-speed

High-speed frame closing the gap . . . slowly.

Frame relay ports shipped (in thousands)



SOURCE: VERTICAL SYSTEMS

than a new frame contract.

"It got to a point where we could no longer do business with AT&T," he says. MoldFlow is ditching its frame relay network for a fully managed IP VPN service from Cable & Wireless.

"We will have four times as much bandwidth in most locations, and we're paying less for it," Thimble says. AT&T did come back to MoldFlow to make the company aware of its managed IP VPN service, but at that point it was too late, he says.

Although AT&T tried to increase MoldFlow's frame relay contract

by 20%, the carrier says that its low-speed frame has gone up only 5% on average, says Steve Sobolevitch, vice president for AT&T Business service pricing. AT&T chalks up most of the increase to local access charges, but also notes the need to raise prices to drive up revenue throughout the industry.

Sprint says that's why it raised its rates.

"Some of the low-speed ports are not profitable," says Bob Landon, senior director of strategic pricing at Sprint. The market changed mid-2002, which "allowed us to reassess pricing. It gave everyone an opportunity to reassess the profitability of services," Landon says. "We have some customers that signed contracts a couple of years ago with prices that are simply no longer available."

"We're not trying to gouge people; we're trying to make money so we can produce a profit," he adds. Users could see 10%, 20%, 30%, 40% and even 50% price increases depending on the number of low-speed frame relay nodes they have, he says. For example, a customer with 500

56/64K bit/sec frame relay connections could see rate increases at the higher end of Sprint's range compared with a customer that may have 10 to 20 low-speed lines in addition to 10 to 20 high-speed frame relay lines.

The pressure to increase revenue is driving rate increases, but low-speed was never as profitable as high-speed frame. Supporting low-speed frame relay is more costly for carriers, says Rick Malone, principal at consulting firm Vertical Systems Group. It costs as much for a carrier to maintain a low-speed port as it does a high-speed port, but the latter brings in "three to four times the revenue," he says.

Despite its Chapter 11 filing, WorldCom is raising rates. The company says it, too, has increased low-speed frame relay prices three times over the past six months by 5% to 8% per instance.

There are steps customers can take to help keep price increases in check, experts say:

- Avoid long-term contracts.
- Work with multiple services providers. Diversifying network providers is sometimes more difficult with small to midsize networks, but it shows an incumbent carrier that a user is willing to take new business elsewhere.
- Keep an eye on the incumbent local exchange carriers that say they plan to more aggressively go after new business and may offer lower rates this year.
- Talk with your incumbent carrier about next-generation data services such as Multi-protocol Label Switching offerings. ■



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Switch eases wireless LAN installation

■ BY JOHN COX

SAN JOSE — A beta-test version of a wireless switch being announced this week by start-up Airespace says the device has simplified the work of running and securing his wireless LAN.

The Airespace 4000 Wireless Switch automatically changes radio channel assignments and radio power levels to optimize performance for 1,100 users at University of California, Berkeley, says Fred Archibald, network manager of the university's electrical engineering and computer sciences department.

"This is a huge win for us," says Archibald, who has been working for about six weeks with the switch and its accompanying access points.

The switch also lets network managers at the department set up an array of virtual wireless LANs (WLAN) each with its own access privileges and security requirements.

The university's new WLAN, which consists of three 24-port Airespace switches and 26 Airespace 1200 Access Points, eventu-

ally will supplant a traditional distributed WLAN of 36 access points that were simply plugged into Ethernet switches. "This [traditional] technique doesn't scale up very well," Archibald says.

Kevin Tolly, president and CEO of The Tolly Group, an independent research and testing company, says WLAN switch vendors such as Airespace are pushing the idea that "you can't keep plugging access points into your wired [network] edge and have an enterprise-scale wireless system . . . I agree with that."

But Tolly says companies should take a detailed look at this emerging class of product. "Vendors have their own view of the wireless universe," he says. "[If you buy their products], you need to embrace their philosophy and buy into their architecture."

Airespace is the latest in a pack of mainly venture-funded startups that are trying to extend to WLANs the kind of control, management and security that network executives are used to in wired networks.

There's no formal definition for a WLAN switch. And these devices

can't allocate the bandwidth of a shared medium, the radio spectrum (the one exception is Vivato, which uses phased array antennas to play three radio beams over a group of wireless clients). Symbol Technologies last year released the first switch-like product.

The 12- and 24-port Airespace switches fit in a wiring closet rack, and support an array of upstream network connections to a wired infrastructure. The software is the key difference from a Layer 2 Ethernet switch. The Airespace code creates a centralized security and management framework that can use the access points as radio monitors, and pin security policies to wireless users no matter where they move.

The Airespace access point incorporates security and management software so the switch can control it. Among other features, the access point continuously sweeps the surrounding air for unauthorized, or rogue, access points and clients. It can "capture" these devices and block their access into an enterprise network, the company says.

Airespace says it will announce a shipment date and pricing for the products around the middle of the year.

Airespace, initially Blackstorm Networks, has raised \$15.5 million in venture funding. Its management team comes from Metri-com, Packeteer, Sun and others. ■

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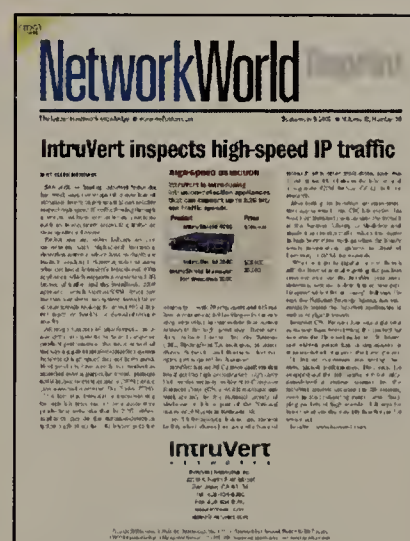
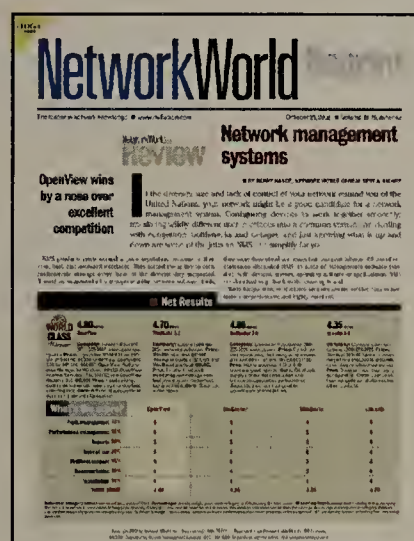
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BackSpin Mark Gibbs



Worser and worser laws

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obtained by federal agents. ... Questions about policy should be directed to Attorney General John Ashcroft, Department of Justice, Washington D.C. 20530."

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Yes, it is true. Hidden inside H.R. 3162, the USA Patriot Act, there is a section titled "Access to records and other items under the foreign intelligence surveillance act." This section gives the FBI carte blanche to find out what you read and watch. Honest.

What is required is an agent asserts your media selection details are "relevant" to an investigation and a warrant will be issued by a secret judge.

And you don't have to be suspected of anything for the FBI to ask for your records. At one time "probable cause" had to be demonstrated, tying the need for data directly to a crime or evidence of a crime but, alas, no more. And the librarian, bookshop or video shop owner is prohibited from telling you that you are being investigated!

Getting worried? Then this is going to really tick you off: Under the wording of the latest draft of the

Patriot II Act, using encryption in the commission of a crime attracts additional penalties much as using a gun in a robbery does.

Say you failed to pay state tax on an Internet purchase (you did know you are responsible for reporting such purchases, right? — see Doc-Finder: 5044). Because you probably made the purchase using a Secure Sockets Layer encrypted link, you could face five extra years for the offense, according to an Associated Press report (DocFinder: 5045).

That is unlikely to happen, as the AP story points out. But there could be a risk for corporations if a zealous prosecutor was determined to "get" them.

Worse still, a number of states, including Massachusetts, Texas, Alaska and Colorado, have draft bills that propose to extend the dreaded Digital Millennium Copyright Act such that the use of routers, firewalls and VPNs would be illegal! No kidding.

The Colorado bill (HB 03-1303, see DocFinder: 5046) is a typical example of the wording of these bills: "A person commits a violation ... if he or she possesses, uses, manufactures, develops, assembles, distributes, transfers, imports into this state, licenses, leases, sells, offers to sell, promotes or advertises for sale, use or distribution any communication device ... to conceal or to assist another to conceal from any communication service provider ... the existence or place of origin or destination of any com-

munication that utilizes a communication device."

Again, common sense tells you that this is unlikely to be interpreted so broadly as to make routers, VPNs and firewalls illegal, but it is not actually certain. And the use of any encryption or network address translation or anonymizing service of any kind will make it easy for the government to request a warrant to see what's going on "just in case."

All this legislation and its weird implications demonstrate The Law of Unintended Consequences. The *Concise Encyclopedia of Economics* (DocFinder: 5047) defines this law as: "[the] actions of people — and especially of government — always have effects that are unanticipated or 'unintended.' Economists and other social scientists have heeded its power for centuries; for just as long, politicians and popular opinion have largely ignored it."

And nowhere do unintended consequences cause more problems than in IT. This legislation needs to be watched carefully. If we don't pay attention, in the next few years we'll see business handcuffed by invasive and repressive laws simply because no one thought them through.

Of course, one thing we'll be sure of: The FBI will be able to tell us what we were reading while we weren't paying attention.

Book lists to backspin@gibbs.com.

'NetBuzz News, insights, opinions and oddities



By Paul McNamara

A dumb idea at exactly the wrong time

Few political pronouncements are more easily ignored than one from a congressman making the case for goods or services sold by a company in his or her district.

Contrary to popular suspicion, it's not even necessary for the provider of such goods and services to wave a campaign contribution under the lawmaker's

nose to assure a full-throated defense of the homegrown product — although such tributes are common and highly recommended. No, going to bat for hometown employers — even if they make buggy whips; even if they make lousy buggy whips — is a time-honored political tradition along the lines of cutting ribbons and kissing babies. It's a big part of what gets our public servants into office and keeps them there until we can't stand to hear them yap for one more blessed minute.

So on that score it's easy to understand — and quickly brush aside — the recent letter that U.S. Rep. Darrell Issa (R-Qualcomm) directed to Secretary of Defense Donald Rumsfeld, who needs such distractions these days like our soldiers need more sand in their boots. As you might have read, Issa and 30 cosigning lawmakers are urging Rumsfeld to pause from his battle strategizing for a moment and reverse an Army plan to build a wireless network in postwar Iraq based on GSM technology. GSM is the widely accepted standard throughout most of the world, including the Middle East. Instead, these lawmakers want to see that network based on CDMA, which has been the technology of choice by some large carriers herein the states.

More to the point — at least Rep. Issa's point — is that CDMA technology is owned and built by Qualcomm, which is located in San Diego. ... which is the heart of Issa's district. The lawmaker also has hitched his cause to the France-

bashing bandwagon that has flattened even the lowly French fry: It seems the ancestry of today's GSM technology can be traced, in part, to that country.

"We're going to be in a position where we are spending U.S. taxpayer dollars to set up a communications system for the Iraqi people," Issa told the Associated Press. "It seems logical to give a preference to U.S. companies and U.S. jobs."

Yes, it's logical, as long as you're a politician whose grasp of the big picture extends as far as the San Diego city limits.

It should make no sense at all to anyone else. Issa's plea is tantamount to demanding that U.S. companies get first dibs on selling wool hats and mittens to the Iraqis. Not exactly a good fit.

Ever since Issa opened this can of worms, honest-to-goodness experts on wireless technology have painstakingly pointed out to the fellow that GSM makes sense for Iraq, if for no other reason than it's dominant in the neighboring countries of Turkey, Kuwait, Saudi Arabia and Israel. Newly liberated Iraqis no doubt will want to do a bit of roaming.

As for GSM being a "foreign" technology — whatever that means — it has been noted that a significant number of U.S. companies have skin in the GSM game, including AT&T Wireless, Cingular and T-Mobile, which have opted for a GSM-based technology (GPRS) in their next-generation networks.

None of which is what's worst about Issa's ill-conceived, ill-timed offensive.

That would be the impression it creates not only in Iraq but the rest of the world. At a time when the Bush administration and our military are striving to present this war as a liberation effort — with limited success — the last thing they need is for a band of U.S. politicians to show themselves as first and foremost profiteers.

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